Hapi User Manual

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IMPORTANT SAFETY AND INSTALLATION INSTRUCTION SAVE THESE INSTRUCTIONS

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING – when using electric products, basic precautions should be followed, including the following:

1. Read all of the safety and installations instructions and explanation of graphic symbols before using the product.

2. The product must be grounded otherwise it could malfunction or breakdown. Grounding provides a path of least resistance or electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

DANGER – Improper connection of the equipment-grounding can result in a risk of electric shock. Do not modify the plug provided with the product – if it will not fit the outlet have a proper outlet installed by a qualified electrician. Do not use an adapter that defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

3. Do not use this product near water – for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

4. This product should only be used with a stand or cart that is recommended by the manufacture.

5. This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

6. The product should be located so that its location or position does not interfere with its proper ventilation.

7. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

8. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply, do not pull on the cord, but grasp it by the plug.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

11. The product should be serviced by qualified service personnel when: A. The power supply cord or plug has been damaged. Objects have fallen, or liquid has spilled into the product, or C. The product has been exposed to rain, or D. The product does not appear to be operating normally or exhibits a

marked change in performance, or E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.

13. WARNING - Do not place objects on the power supply cord, or place the product in a position where anyone could trip over, walk on, or roll anything over cords of any type. Do not allow the product to rest on or be installed over cords of any type. Improper installations of this type create the possibility of a fire hazard and/or personal injury.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

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Windows 7 is a trademark of Microsoft Corporation.
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IMPORTANT NOTICE:
Please read the following information very carefully before attempting any installation. Failure to comply with the precise instructions may result in damage to your Merging hardware. Please read this entire section of the manual carefully before installation.

STATIC DANGER NOTICE:

Please note that the Hapi contains delicate electronic components that can be damaged or even destroyed when exposed to static electricity. Take all necessary precautions not to discharge static electricity when touching any of the Hapi connectors.

Product Regulatory Compliance

The Merging Hapi Network Converter is designed and tested to meet the standards and regulations listed in the following sections.

Product Safety Compliance

Hapi complies with the following safety requirements:

- UL 1950 – CSA 950 (US/Canada).
- EN 60 950 (European Union).
- IEC 60 950 (International).
- CE – Low Voltage Directive (73/23/EEC) (European Limits).
- EMKO-TSE (74-SEC) 207/94 (Nordics).

Product EMC Compliance

The system has been tested and verified to comply with the following EMC regulations:

- FCC (Class A Verification) – Radiated and Conducted Emissions (USA).
- CISPR 22, 3rd Edition (Class A) – Radiated and Conducted Emissions (International).
- EN45022 (Class A) – Radiated and Conducted Emissions (European Union).
- EN45024 (Immunity) (European Union).
- EN6100-3-2 & -3 (Power Harmonics and Fluctuation and Flicker).
- CE – EMC Directive (89/33/EEC) (European Union).

Electromagnetic Compatibility Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2), this device must accept any interference received, including interference that may cause undesired operation.
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.
Only peripherals (computer input/output devices, Ethernet switches, terminals, printers, etc.) that comply with FCC Class B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.
All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded, may result in interference to radio and TV reception.

Environmental Limits

System Office Environment Parameter Limits
Operating Temperature +5 degrees C to +45 degrees C with the maximum rate of change not to exceed 10 degrees C per hour.
Non-Operating Temperature -40 degrees C to +70 degrees C
Non-Operating Humidity 95%, non-condensing @ 30 degrees C
Operating Shock No errors with a half sine wave shock of 2G (with 11-millisecond duration).
Package Shock Operational after a free fall, 60 cm depending on the weight.
ESD 15kV per Merging Environmental Test Specification

CE

Declaration of Conformity

According to

EMC Directive 2004/108/EC

Product	**Horus**
Manufacturer	**Merging Technologies SA** **Le Verney 4** **CH-1070 Puidoux** **Switzerland**
Electrical Rating	**90-260 VAC, 50/60 Hz, 0.2 A (at 230V)**
Standards	**EN 55103-1:2009, EN 55103-2:2009, EN 61000-3-2 :2006+A1+A2, EN 61000-3-3 :2008**

Detailed specifications of the tested and certified product are shown in the following Test Report:

Test report Ref No: 16'835 Issued Date: June 2012 by Montena EMC SA

The CE label is affixed on the rear of left side of the Horus unit as per below :

Date 12 June 2012

Claude Cellier
President
Merging Technologies S.A.

Hapi Warranty Information

This product is warranted to be free of defects in materials and workmanship for a period of one year from the date of purchase. Merging Technologies, Inc. extends this Limited Warranty to the original purchaser.
In the event of a defect or failure to confirm to this Limited warranty, Merging Technologies, Inc. will repair or replace the product without charge within sixty (60) days. In order to make a claim under this limited warranty, the purchaser must notify Merging Technologies, Inc. or their representative in writing, of the product failure. In this limited warranty the customer must upon Merging Technologies, Inc. request, return the product to the place of purchase, or other local designation, for the necessary repairs to be performed. If the consumer is not satisfied with the repair, Merging Technologies, Inc. will have the option to either attempt a further repair, or refund the purchase price.
This warranty does not cover: (1) Products which have been subject to misuse, abuse, accident, physical damage, neglect, exposure to fire, water or excessive changes in the climate or temperature, or operation outside maximum rating. (2) Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible. (3) The cost of installations, removal or reinstallation. (4) Damages caused to any other products. (5) Do not attempt to service the equipment. There are no user serviceable parts inside*. Please refer all servicing to an authorized Merging sales partner. Any attempt to service the equipment will expose you to a risk of electric shock, and will void the manufacturer's warranty.

** Replacing or adding a AD, DA or MADI module and adjusting the DA module dip switch (output) is permitted under the supervision of a Merging sales partner. Any other modification will void the Hapi warranty.*

Contacting Merging

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For all documentation inquiries or suggestions for improvement:
www.merging.com

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Introduction to Hapi

Modular by Design
Hapi, the son of Horus. Born from the most flexible and sonically transparent audio interface and providing the same RAVENNA / AES67 connectivity as its father, Hapi is both the perfect primary interface for smaller systems as well as the ultimate accessory for a system using Horus where control room I/O is required. Hapi was designed to give its users an Audio I/O channels flexibility while offering an unprecedented level of quality in such a small form factor.
Providing as standard; 8 channels of AES- EBU I/O plus 8 ADAT or 2 SPDIF I/O (on TOSLINK) and 2 slots for AD8D/AD8P, DA8/DA8P and MADI option cards. Once the Hapi is fully loaded with option cards, it is capable of achieving 88 inputs and 90 outputs @ 1FS There are indeed 2 more output channels than input channels, including the Stereo Headphone Monitoring.

Route Signal Anywhere
Hapi has been designed so that any input can be routed to any number of outputs as required simultaneously. With comprehensive routing pages accessible both locally on the touchscreen and by remote access using a standard web browser, Hapi is the answer to signal flow management in your studio.

Green Built
For environmentally-conscious users, Hapi has been designed meticulously in order to keep power consumption at an incredible minimum. A fully loaded Hapi running all channels of phantom power will only draw about 30W, making it more affordable to run than your kitchen lights.

Hapi Key Features
• Up to 88 inputs and 90 outputs @1FS
• 8x AES/EBU + 8x ADAT or 2x SPDIF (Optical)
• Works from 44.1kHz to 192kHz (Premium up to DXD/DSD256)
• Signal routing from any input to any combination of outputs
• RAVENNA / AES67 Compatible
• Browser-based remote access using any web enabled device
• AC or DC power supply options
• Modular design for additional analog and Digital I/O
• Near-zero latency from in to out (<1ms)
• Main rotary control button

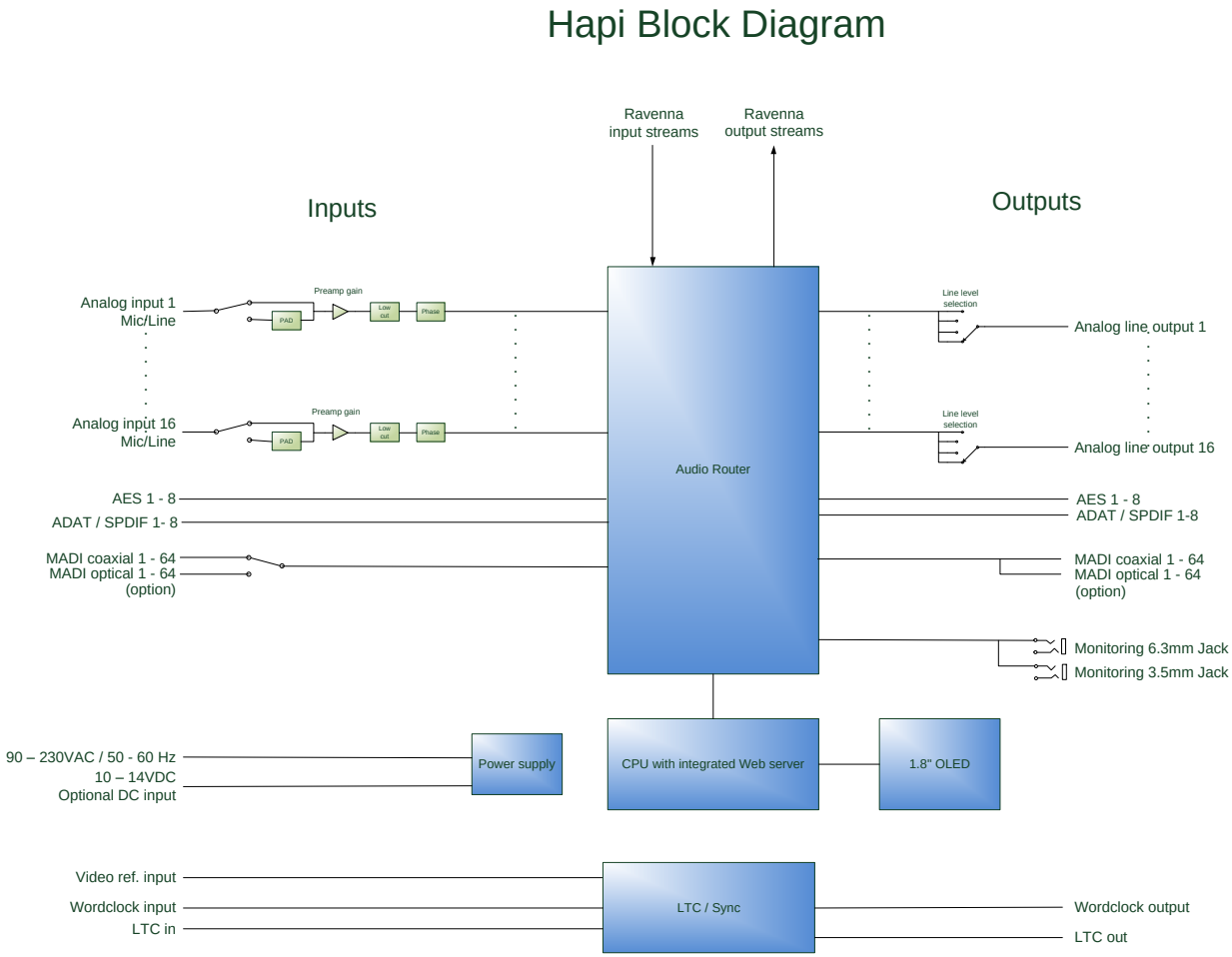
RAVENNA
The Hapi has been designed so that the MADI, AES, SPDIF/ADAT and Analog modules can all feed into or take their sources from the network over RAVENNA streams, providing up to 88 channels of I/O @ 1FS over a single CAT5e or CAT6 cable to any other RAVENNA devices on the network.

The RAVENNA connection on the Hapi allows for not only audio, but also control and sync information to flow through as well. Send Timecodes and Wordclock directly to the Hapi unit over the same network as your audio. The RAVENNA port even provides for remote control access to the configuration and entire routing of the unit itself! Support for: LTC/MIDI/Video Ref/WCK

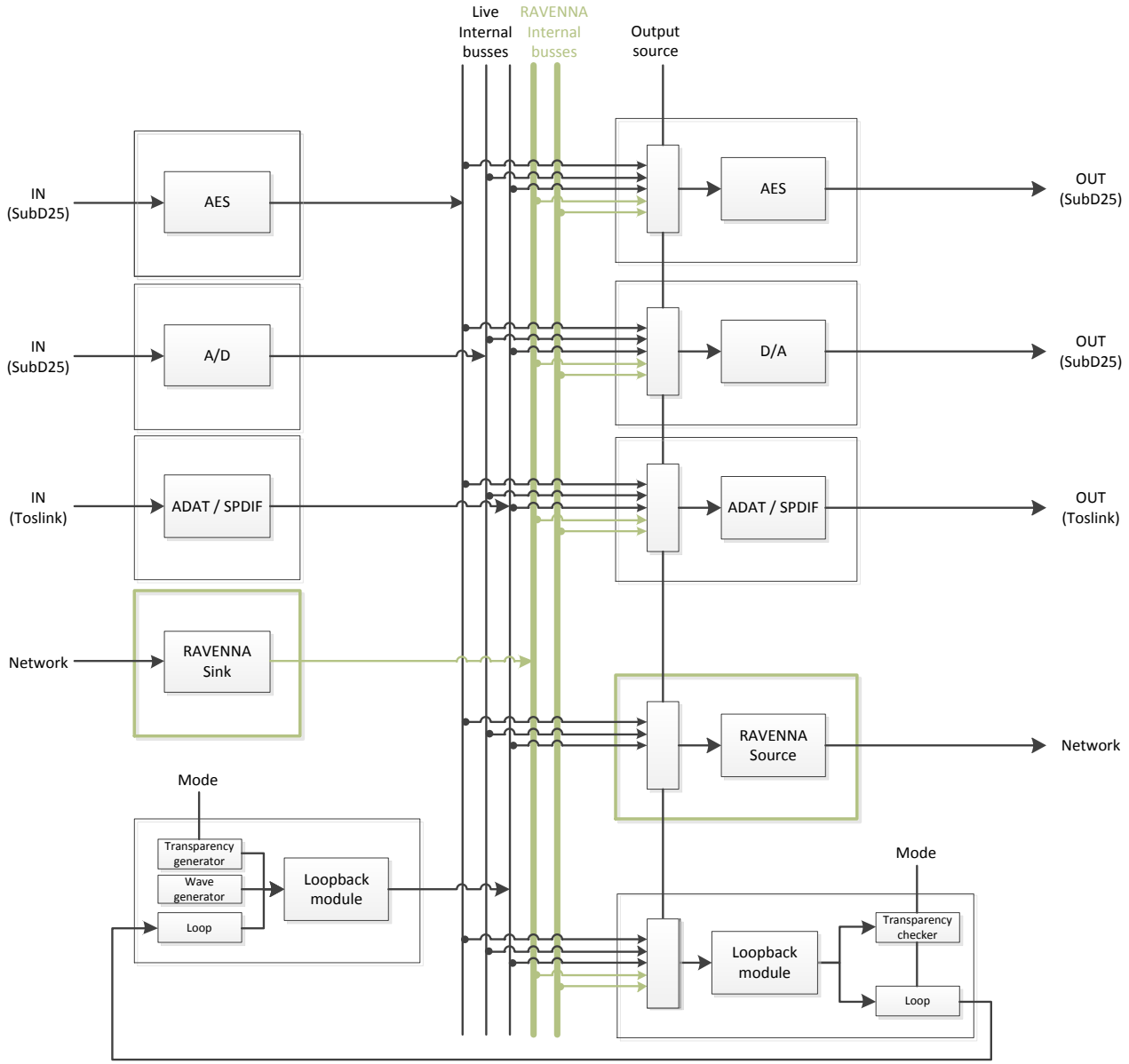
RAVENNA is a layer 3 IP based protocol. In environments where existing networks are already in place, RAVENNA subnets can slip right into place with no additional outlay. In laymen's terms, this means that you can connect your Hapi to a properly configured network exactly as you would your PC or Mac, with no additional technology required.

RAVENNA is a "mission critical" protocol, meaning that is has been designed to ensure immensely low jitter rates and latencies (sub-millisecond) and ensures that every single sample gets to where it needs to go without fail. Hapi also provides a secondary, redundant RAVENNA connection allowing for uninterrupted use, even when a network connection fails.
Refer to the *RAVENNA User Guide* and the *MassCore-RAVENNA Configuration Guide* for more details

Hapi block diagram



Hapi modules interconnection diagram

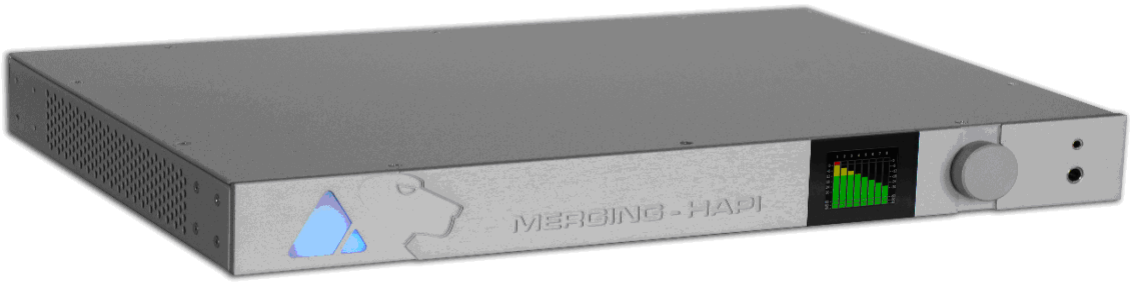


HAPI HARDWARE

FRONT PANEL

BACK PANEL

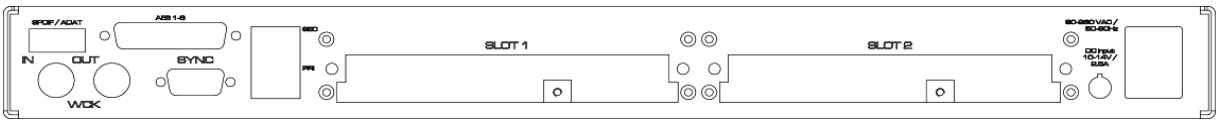
HAPI UNIT



HAPI SCHEMATIC IMAGES

Front Panel

Back Panel



HAPI BASE UNIT

IOC-HAPI Specifications

Case Material	Powder Coated Steel
Front Panel Material	Brushed Aluminum
Weight (excluding redundant PS)	4.5 kg / 10 lbs
Dimensions (1U rack mounting)	483 x 320 x 44 mm
Voltage (AC)	90V–260V, 47–63 Hz
Voltage (DC) (option IOC-HAPI-PSR)	10-14V
Power Consumption (Max)	< 30 Watts
Front Panel TFT size/resolution	OLED (160x128 px)

Headphone Monitor Jacks

Headphone Jack 1&2	6.3 mm(1/4")/3.5mm
Max output Level (Unbalanced)	Load = 300 Ohms +14.5 dBu
Output Impedance	75 Ω
Dynamic Range (A-weighted, typ.)	112 dB
THD+N (1 kHz) @ -2 dBFS	< -100 dB (0.001 %)
Gain Range (software controlled)	- ∞ dB to +12 dB
Gain Step/Precision	1dB / ±0.05 dB

SYNC Connectors

"Sync" Cable (LTC/Video Ref/MIDI)	D-Sub 15Pin
LTC In & Out (via "Sync" Cable)	Balanced XLR
Video Reference In (via "Sync" Cable)	BNC
MIDI (I/O via "Sync" Cable)	5-Pin DIN
Word Clock Input (Switchable 75 Ω Termination)	BNC, 0.5Vp-p min
Word Clock Output (Zout = 35 Ω)	BNC, 5Vp-p
Maximum supported deviation	+/-1000ppm

RAVENNA module

RAVENNA Primary / Secondary (GbE)	RJ45

AES-EBU module

AES type/pinout	DB-25 / AES59 (Tascam Dig.)
AES i/o	Grounded and transformer coupled
Output Impedance	110 Ω

MADI module

MADI types (Coaxial / Optical)	BNC / SC
Output Impedance	75 Ω

ADAT/SPDIF module

ADAT/SPDIF	Optical Toslink

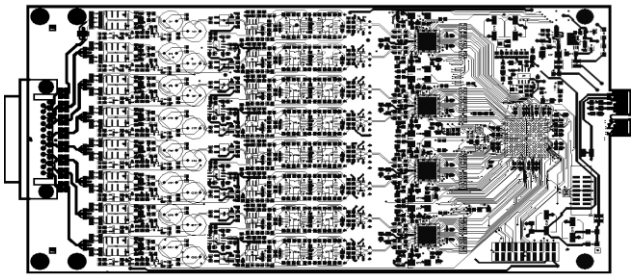
Software Specifications

RAVENNA MassCore Driver	Pyramix v8.0 or Higher / Win7 32bit or 64bit
Windows Driver/OS	ASIO 2.2 / Win7 32 or 64bit
Mac Driver/OS	CoreAudio / MacOS 10.8.5 or higher (Intel)

Hapi optional cards

IOM-HORUS-AD8/AD8P

These remotely controlled Mic/Line Input cards have set a new benchmark in analog circuitry design. Available in models that work up to 192kHz (**AD8**) and DXD/DSD256 (**AD8P**)



IOM-HORUS-AD8/AD8P Key Features

- 8 x exceptionally transparent, Swiss designed pre-amplifiers
- Remote/Local switch to Line Level on a per channel basis
- Completely accessible remotely for all parameter changes
- Phantom Power/Phase/Low Cut switchable per channel
- Better than 120dB dynamic range

IOM-HORUS-AD8/AD8P Specifications

IOM-HORUS-AD8/AD8P Mic Pre-Amp + ADC

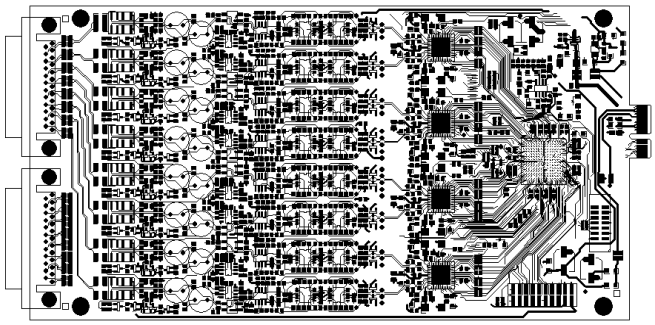
Mic Pre Max Input (Pad On / Pad Off)	+24 dBu / +13 dBu
Input Impedance (Differential)	1.75 kΩ
Dynamic Range (A-weighted, typ.) , ref +13 dBu	122 dB
Gain Range (software controlled)	0 dB to +66 dB
Gain Step/Precision	0.5 dB / ±0.2 dB
THD+N Pre + A/D (20 Hz-20 kHz) @ -2 dBFS (AD8/AD8P)	0.0016 % / 0.001 %
Interchannel Crosstalk @ 1kHz, typ.	-125 dB
EIN @ >40 dB Gain (150Ω Source Impedance, A-weighted, typ.)	-128 dBu
Common Mode Rejection Rate @ 1kHz, typ.	75 dB
Phantom Power (Software Switchable Per Channel)	+48V
Phase Reverse (Software Switchable Per Channel)	YES
Low Cut filter (Software Switchable Per Channel)	-12 dB/octave, 80 Hz
Line Input	
Max Line Input for 0 dBFS	+24 dBu
Input Impedance (Differential)	6.5 kΩ
Dynamic Range (A-weighted, typ), ref +24 dBu	122 dB
THD+N Line+A/D (20 Hz-20 kHz) @ -10 dBFS, typ..	-106 dB (0.0005%)
Interchannel Crosstalk @ 1kHz, typ.	-125 dB
Sensitivity Range for 0 dBFS (software controlled)	-36 dBu to +24 dBu
Gain Step/Precision	0.5 dB / ±0.2 dB
Common Mode Rejection Rate @ 1kHz, typ.	75 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

IOM-HORUS-AD8/AD8P Mic-Pre Analog Section

Frequency response +0/-0.5 dB, Line	5 Hz - 75 kHz
Frequency response +0/-2.0 dB, Line	2.5 Hz - 150 kHz
Frequency response +0/-0.5 dB, Mic	10 Hz - 100 kHz
Frequency response +0/-2.0 dB, Mic	5 Hz - 200 kHz
THD+N (1 kHz), Line/Mic at G=0dB	<-115 dB (0.00018 %)
THD+N (20 Hz-20 kHz) , Line/Mic at G=0dB	<-112 dB (0.00025 %)
Interchannel Crosstalk @ 1kHz, typ.	-135dB
5° low-end in-channel Ø deviation pt: Line	13 Hz
5° low-end in-channel Ø deviation pt: Mic	35 Hz
Interchannel phase 10 Hz - 100 kHz	< ±0.1°

IOM-HORUS-AD8D/AD8DP

These cards have the same specifications as the IOM-HORUS-AD8/AD8P cards and provide additionally a Line level post Mic-pre “Direct Out” output.
Available in models that work up to 192kHz (**AD8D**) and DXD/DSD256 (**AD8DP**)



IOM-HORUS-AD8D/AD8DP Key Features

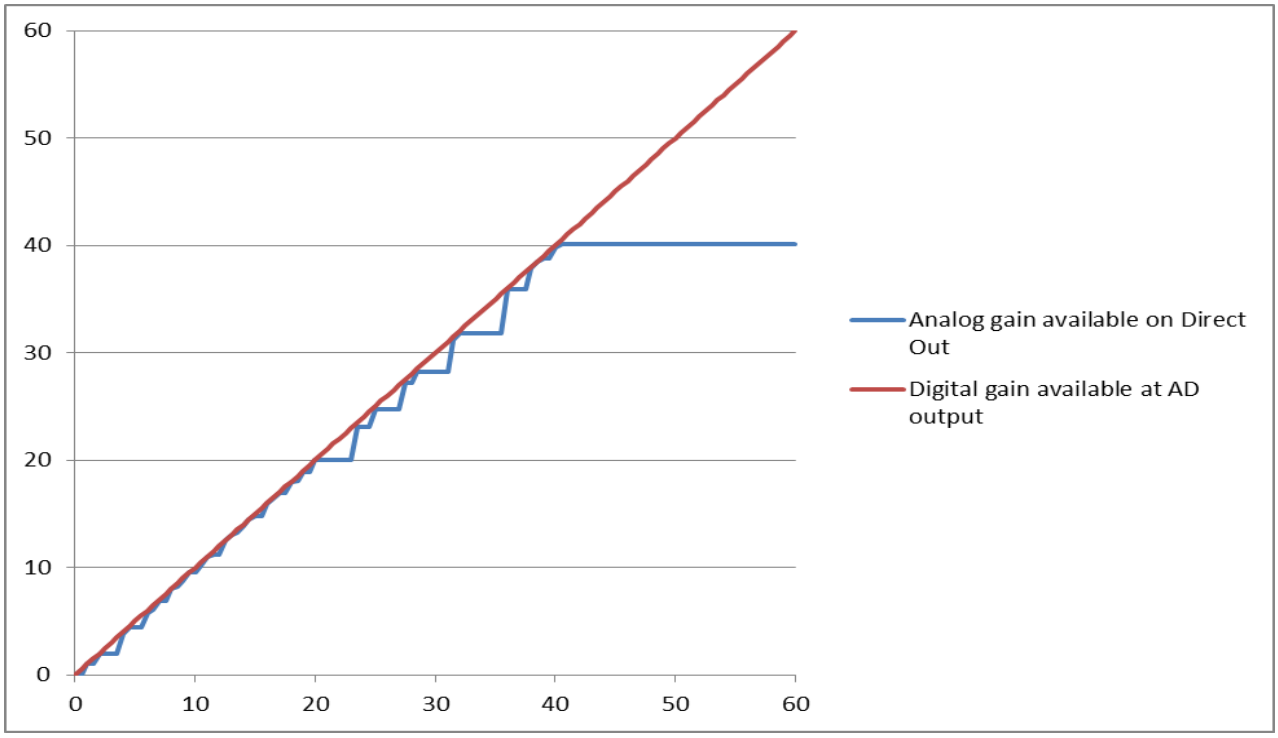
- Removes the need for DI boxes
- Allows build-in Mic splitting variants

IOM-HORUS-AD8D/AD8DP Direct Out Section

Frequency response +0/-0.3dB @ Gain 40dB	10 Hz –50kHz
Max Direct Output level typ.	+18.5 dBu
Output Impedance (Differential)	< 100 Ω
Dynamic Range (A-weighted, typ)	124.5 dB
THD+N (1 kHz) @ +11dBu	< -109dB (0.00035 %)
Input Connector Pinout	DB-25 / AES59 (Tascam Ana.)
Direct Output Connector Pinout	DB-25 / AES59 (Tascam Ana.)

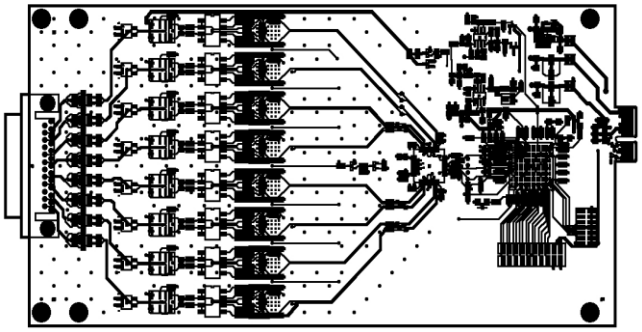
Gain behavior of the Direct Out section

As the Direct Out output is taken just after the Mic-pre analog section, the gain adjustments are not as smooth and linear as after the digital conversion. The figure below shows the behaviour of the gain on the Direct Out (in blue) compared to the gain on the digital side (in red).
Note: on the Direct Out the maximum available gain is + 40.1 dB.



IOM-HORUS-DA8/DA8P

The **DA8** (up to 192kHz) and the **DA8P** (up to DSD) have been shown in testing to be consistently the quietest multichannel D/A conversion modules available anywhere.



IOM-HORUS-DA8/DA8P Key Features

- Auto-mute circuitry for “no-pop” power cycling
- Digitally controlled trims for line up procedures
- Dynamic range of 127dB (typ.)
- Software control or easy to set dip switches for international operating levels

IOM-HORUS-DA8/DA8P Specifications

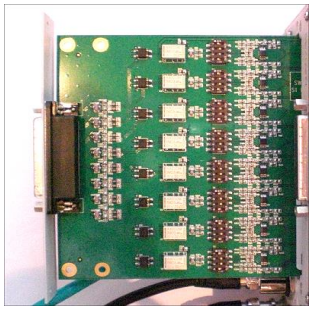
Max Line Output @ 0 dBFS (jumpers on +24 dBu)	+24 dBu +0/-0.5 dB
Frequency response +0/-0.3dB @ fs = 48000 Hz	6 Hz – 20 kHz
Frequency response +0/-0.3dB @ fs = 2.8224 MHz (DSD)	NA / 6 Hz – 20 kHz
Frequency response +0/-3.0dB @ fs = 2.8224 MHz (DSD)	NA / 2 Hz – 50 kHz
Line Output Impedance (Differential)	100 Ω
Dynamic Range (A-weighted, typ)	126 dB
THD+N D/A (1 kHz) @ 0 dBFS (IOM-HORUS-DA8)	< -113dB (0.00022 %)
THD+N D/A (1 kHz) @ 0 dBFS (IOM-HORUS-DA8P)	< -115dB (0.00018 %)
Interchannel Crosstalk @ 1kHz, typ.	-135 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

Line Output Level calibration

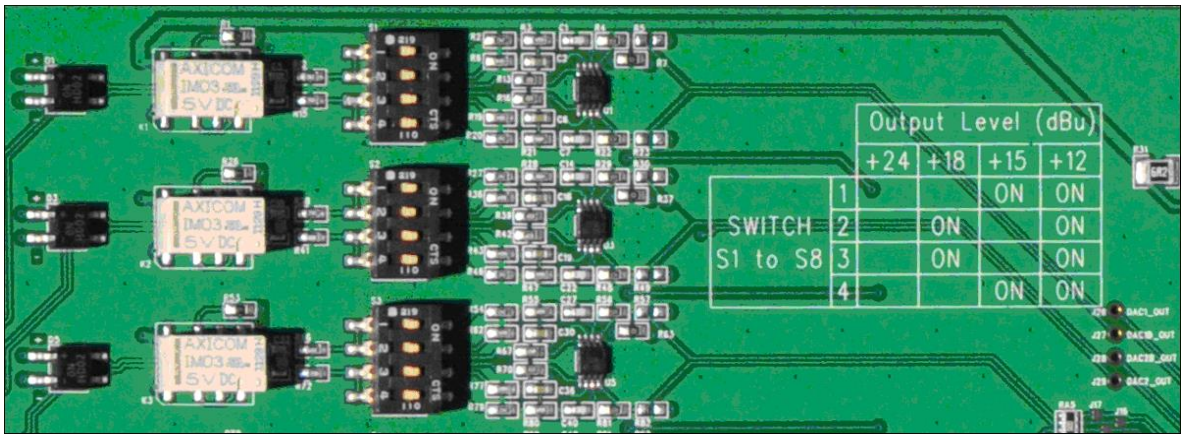
The DA8 and DA8P modules feature both hardware level settings and a software fine adjustment to align the Analog Output levels to whatever local/organization operational levels are mandated.
On DA8/DA8P cards from run 7 upwards, the hardware level setting is done via software through the option “max output level” in each DA’s setting page.
On DA8/DA8P cards prior to run 7 the hardware level setting is in the form of 4 DIP switches per output channel
The Hardware settings will usually be set only once, at product installation, and only if the desired Operating Line Level differs from the default ex-factory settings of +18 dBu for 0 dBFS.

Procedure for Hardware alignment (for DA8 prior to run 7):

1. Shut down your Hapi.
2. Unscrew all DA8 modules that need adjustment.
3. Pull gently out (5-7 cm is enough) to access the DIP Switches. There is one block of 4 dip switches per channel. Channel 1 is labeled S1, channel 8 is labeled S8.



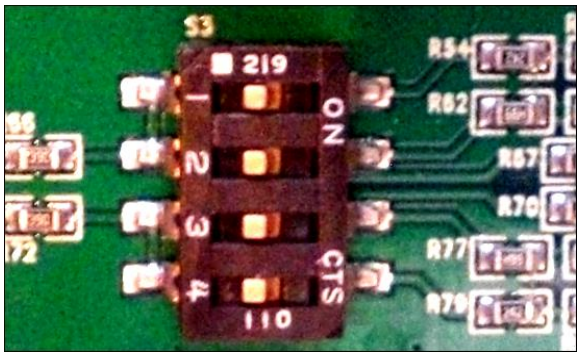
4. Set the DIP Switches as per the table legend printed on the DA8 module card



		Output Level (dBu)			
		+24	**+18**	**+15**	**+12**
Switch S1 to S8	**1**			**ON**	**ON**
	2		**ON**		**ON**
	3		**ON**		**ON**
	4			**ON**	**ON**

Output Level calibration Example:

Assuming your operating Level is 21 dBu for 0 dBFS (typical of French Radio Broadcasters), you should set the DIP Switches all OFF (DIP Switch positioned to the left, with respect to the picture below) to set maximum Output Level to +24 dBu (since there is no 21 dBu hardware setting)

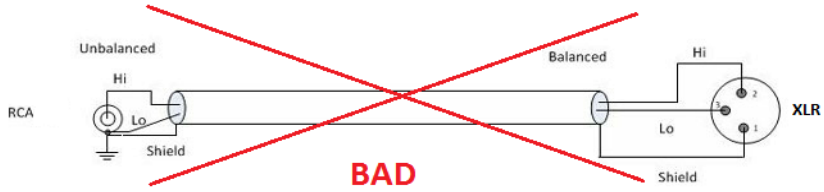


Once this is set and the DA modules are screwed back in place. Power up the Hapi and go to the Hapi Setup Page>Module, select each D/A module for software calibration.
In this example case set the software attenuation to - 3 dB (see image below), so the overall result ends up at 21 dBu for a Full Scale signal

The Hapi software Output Attenuation range is from -60dB to 0dB

How to connect the symmetrical line out to an unbalanced input

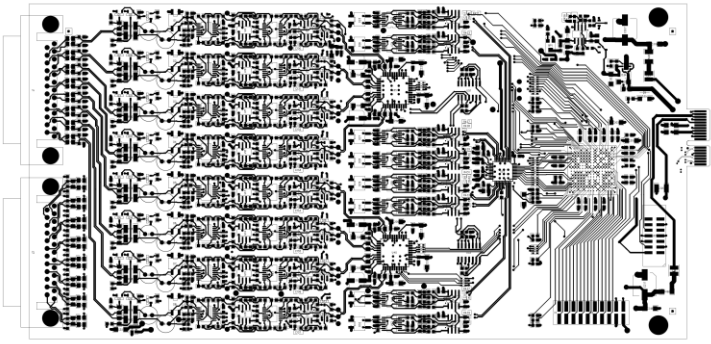
Never attempt to short pin 3 (or pin 2) to Ground on Hapi DA's output, since the Hapi Line Out driving circuitry is symmetrical but not floating.



Furthermore, as Unbalanced Inputs are traditionally more sensitive than Balanced Inputs, the - 6dB Analog level achieved by using only one of the Hapi symmetrical outputs, will offer better signal level adaptation with less risks of overdriving the Unbalanced Inputs connected to the Hapi.

IOM-H-ADA8

These remotely controlled Mic/Line Input and Output cards have broken a new barrier in terms of compactness as well as ultra-low power consumption without compromising on the audio quality.
These cards work at sampling rates up to 192 kHz
Using those combined 8 channel Mic/Line In and Line Out cards allow the Hapi to be configured with up to 16 channels of Analog In/Out.



IOM-H-ADA8 Key Features

- 8 x exceptionally transparent, Swiss designed pre-amplifiers
- Remote/Local switch to Line Level on a per channel basis
- Completely accessible remotely for all parameter changes
- Phantom Power/Phase/Low Cut/Impedance switchable per channel
- Dynamic range of 120dB (A-weighted, typ) on the Line inputs
- Auto-mute circuitry for “no-pop” power cycling
- Digitally controlled output trims for line up procedures
- Dynamic range of 123dB (A-weighted, typ.) on the Line outputs

IOM-H-ADA8 Specifications

IOM-H-ADA8 Mic-Pre + ADC Section

Mic Pre Max Input (Pad On / Pad Off)	+24 dBu / +13 dBu
Input Impedance (Differential, Software Switchable Per Channel)	2 kΩ / 13.6 kΩ
Input Impedance with +48V ON (Diff., Soft. Switchable Per Channel)	1.7 kΩ / 6.8 kΩ
Frequency response +0/-0.3dB @ fs = 48 kHz	10 Hz – 22 kHz
Frequency response +0/-0.3dB @ fs = 96 kHz	10 Hz – 44 kHz
Frequency response +0/-0.3dB @ fs = 192 kHz	10 Hz – 85 kHz
Dynamic Range (A-weighted, typ.), ref +13 dBu	119.5 dB
Gain Range (software controlled)	0 dB to +66 dB
Gain Step/Precision	0.5 dB / ±0.2 dB
THD+N Pre + A/D (20 Hz - 20 kHz) @ -2 dBFS	< -102 dB (0.0008 %)
Interchannel Crosstalk @ 1kHz	< -125 dB
EIN @ >40 dB Gain (150Ω Source Impedance, A-weighted)	< -128 dBu
Common Mode Rejection Rate (20 Hz – 20 kHz)	> 60 dB (up to 0 dBFS)
Phantom Power (Software Switchable Per Channel)	+48V
Phase Reverse (Software Switchable Per Channel)	YES
Low Cut filter (Software Switchable Per Channel)	-12 dB/octave, 80 Hz

IOM-H-ADA8 Line input Section

Max Line Input for 0 dBFS	+24 dBu
Input Impedance (Differential)	13.6 kΩ
Dynamic Range (A-weighted, typ.), ref +24 dBu	120 dB
THD+N Line+A/D (20 Hz - 20 kHz) @ -2 dBFS	< -102 dB (0.0008%)
Interchannel Crosstalk @ 1kHz	< -125 dB
Sensitivity Range for 0 dBFS (software controlled)	-42 dBu to +24 dBu
Gain Step/Precision	0.5 dB / ±0.2 dB
Common Mode Rejection Rate (20 Hz – 20 kHz)	> 60 dB (up to 0 dBFS)
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

IOM-H-ADA8 Mic-Pre Analog Section

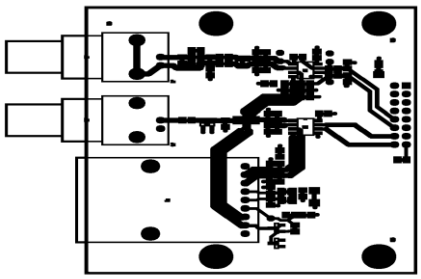
Frequency response +0/-0.5 dB, Line	5 Hz - 75 kHz
Frequency response +0/-2.0 dB, Line	2.5 Hz - 150 kHz
Frequency response +0/-0.5 dB, Mic	10 Hz - 100 kHz
Frequency response +0/-2.0 dB, Mic	5 Hz - 200 kHz
THD+N (1 kHz), Line/Mic at G=0dB	<-115 dB (0.00018 %)
THD+N (20 Hz-20 kHz) , Line/Mic at G=0dB	<-112 dB (0.00025 %)
Interchannel Crosstalk @ 1kHz, typ.	-135dB
5° low-end in-channel Ø deviation pt: Line	13 Hz
5° low-end in-channel Ø deviation pt: Mic	35 Hz
Interchannel phase 10 Hz - 100 kHz	< ±0.1°

IOM-H- ADA8 Line Out Section

Max Output level software switchable for 0 dBFS	+24 dBu / +18 dBu +0/-0.5 dB
Frequency response +0/-0.3dB @ fs = 48 kHz	6 Hz – 22 kHz
Frequency response +0/-3dB @ fs = 96 kHz	6 Hz – 44 kHz
Frequency response +0/-3dB @ fs = 192 kHz	6 Hz – 88 kHz
Output Impedance (Differential)	< 100 Ω
Dynamic Range (A-weighted, typ.)	123 dB
THD+N (1 kHz) @ 0dBFS	< -108 dB (0.0004 %)
Interchannel Crosstalk @ 1kHz	< -135 dB
Connector Pinout	DB-25 / AES59 (Tascam Ana.)

IOM-HAPI-MADM/MADS

The MADI optional Module card (**MADM** - Multimode / **MADS** – Single mode) provides a channel count of 64 inputs and 64 outputs @1FS



IOM-HAPI-MADM/MADS Features

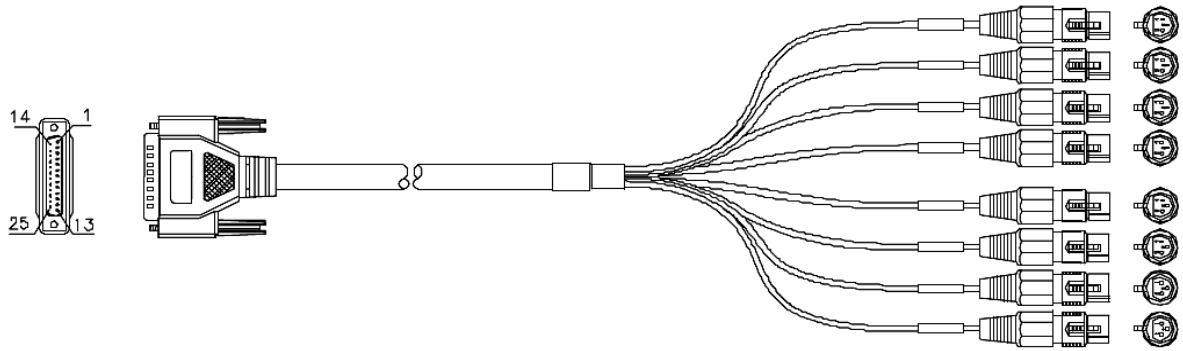
- MADI Optical and Coaxial inputs and outputs
- 64 discrete channels of digital input and output (extended mode) at 1FS
- Up to 384 kHz sampling rate
- 24-bit resolution
- Fully compliant MADI (AES 10-1991)
- 2 BNC and 1 SC connectors (Multimode or single mode)

Single mode fibers have a lower power loss characteristic than multimode which means that it supports longer runs but single mode fibers are more expensive. The multimode version (IOM-HAPI-MADM) is the most widely used optical MADI connection, but for fiber lengths of more than 600m Merging Technologies recommends to use the single mode version (IOM-HAPI-MADS).

Hapi cables

Connecting the analog audio Input cables to the AD8/AD8P modules

The AD/AD8(P) modules connect the Mic/Line Inputs using DB25 D-SUB connections.
Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications
▪ Part: CON-D25-XLRF
▪ Cable Color: black
▪ Numbered XLR fan-out
▪ Cable Ø: 12 mm
▪ Cable Length: 1,5 m
▪ Cable Weight: 500 gr

In 1	In 2	In 3	In 4	In 5	In 6	In 7	In 8
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

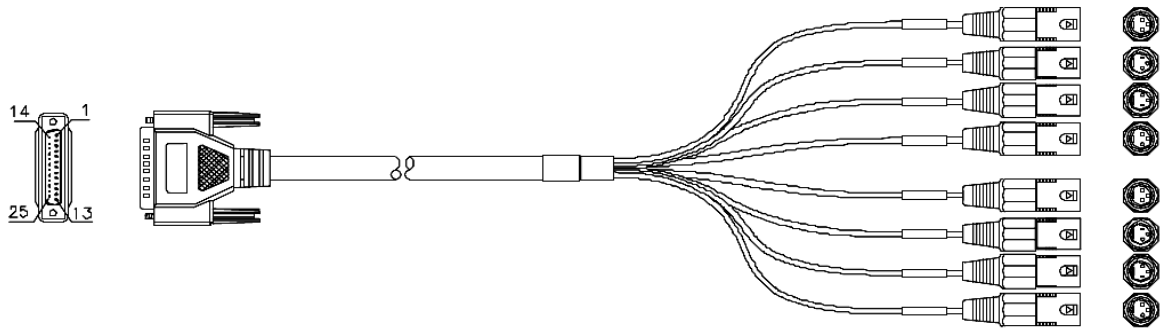
To connect the DSUB connection to the IOC-AD8(P), align the Male cable connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has retention screws on either side, then fasten them finger-tight once the connector has been pushed into place.

Note: The pinout of the DB-25 is as per AES59 (Tascam Analog).

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure on the module's DSUB connector could damage the Hapi unit.

Connecting the analogue outputs cables to the DA8/DA8P modules

The IOC-DA8(P) modules connect the line outputs using DB25 D-SUB connections.
Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications

- Part: CON-D25-XLRM
- Cable Color: black
- Numbered XLR fan-out
- Cable Ø: 12 mm
- Cable Length: 1,5 m
- Cable Weight: 500 gr

Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7	Out 8
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

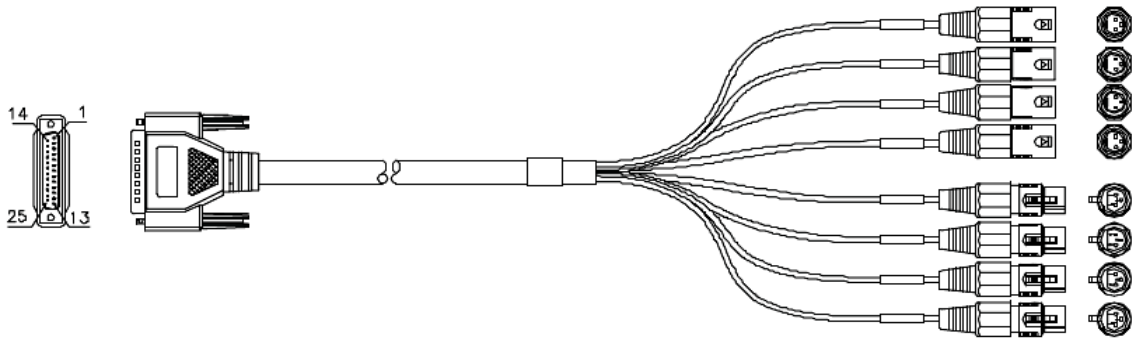
To connect the DSUB connection to the IOC-DA8(P), align the Male cable connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has mounting screws on either side, then fasten them finger-tight once the connector has been pushed into place.

Note: The pinout of the DB-25 is as per AES59 (Tascam Analog).

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure on the module's DSUB connector could damage the Hapi unit.

Connecting the AES-EBU cable

The AES ports connect the AES-EBU I/O using DB25 D-SUB connections.
Please ensure that the cables you have chosen to use, or have had made, conform to this specification before you attempt to connect them.



Specifications

- Part: CON-D25-XLRD
- 192 kHz ready
- Cable Color: black
- Impedance: 110 Ohm
- Numbered XLR fan-out
- Cable Ø: 12 mm
- Cable Length: 1,5 m
- Cable Weight: 500 gr

AES In 1 (1/2)	AES In 2 (3/4)	AES In 3 (5/6)	AES In 4 (7/8)	AES Out (1/2)	AES Out (3/4)	AES Out (5/6)	AES Out (7/8)
Pin 24= (+) Pin 12 = (-)	Pin 10= (+) Pin 23 = (-)	Pin 21= (+) Pin 9 = (-)	Pin 7= (+) Pin 20 = (-)	Pin 18= (+) Pin 6 = (-)	Pin 4= (+) Pin 17 = (-)	Pin 15= (+) Pin 3 = (-)	Pin 1= (+) Pin 14 = (-)
GND is connected to Pins: 2, 5, 8, 11, 16, 19, 22, 25. Pin 13 is not connected							

To connect the DSUB connection to the AES port, align the Male connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. If your DSUB connector has mounting screws on either side, then fasten them finger-tightn once the cable has been pushed into place.

Note #1: The pinout of the DB-25 is as per AES59 (Tascam Digital).
Note #2: Users that have Mykerinos AES or Dual cables cannot use those with their Horus or Hapi as the pin out is not compatible.
Note #3: DB25 TDIF cables are not compatible with Horus/Hapi AES

** THESE CONNECTIONS ARE NOT MEANT TO SUPPORT ANY SIGNIFICANT WEIGHT.**
Ensure that there is no strain from the connected cable as any significant pressure to the module's DSUB connector could damage the Hapi unit.

Connecting the MADI cable

The MADI port (optional MADI Module) can be connected using either Optical or coaxial cabling.

When using Optical cabling, first ensure that you have a clean work area, as dust and debris can affect the connection if any obstruction is present.
Remove the cap on both the cable and the port and slowly / firmly push the cable into the receiving port on the Hapi unit until it clicks into place.
The MADI optical connector is available in Multimode or Single mode versions.
The Hapi is delivered with Multimode connectors unless specified at ordering.

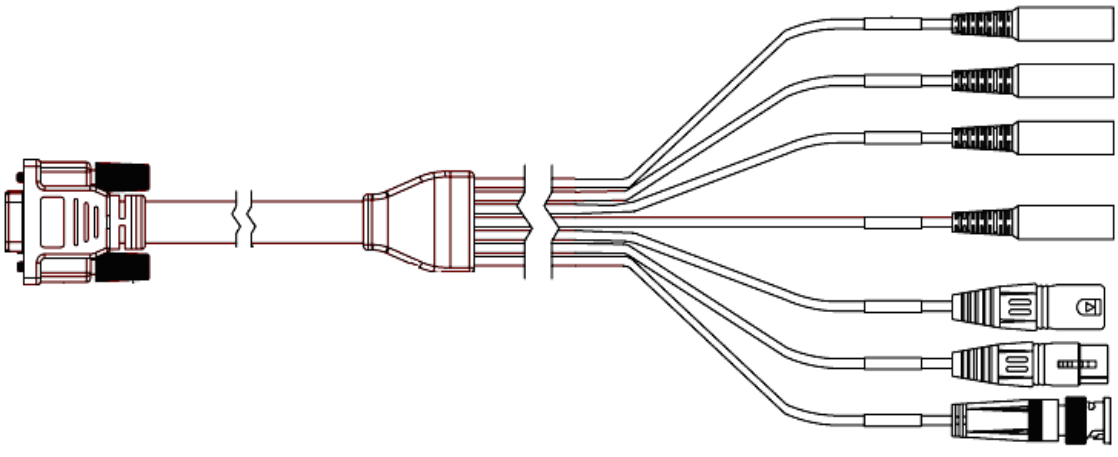
When Using a Coaxial connector. Slowly bring the Male cable up to the female port, ensuring that the pin in the centre of the male cable lines up with the receptacle in the female port. Push the connector firmly into place and twist the sleeve clockwise until it clicks into its locked position.
Maximum recommended cable length is 100 meters

Connecting the Wordclock input/output

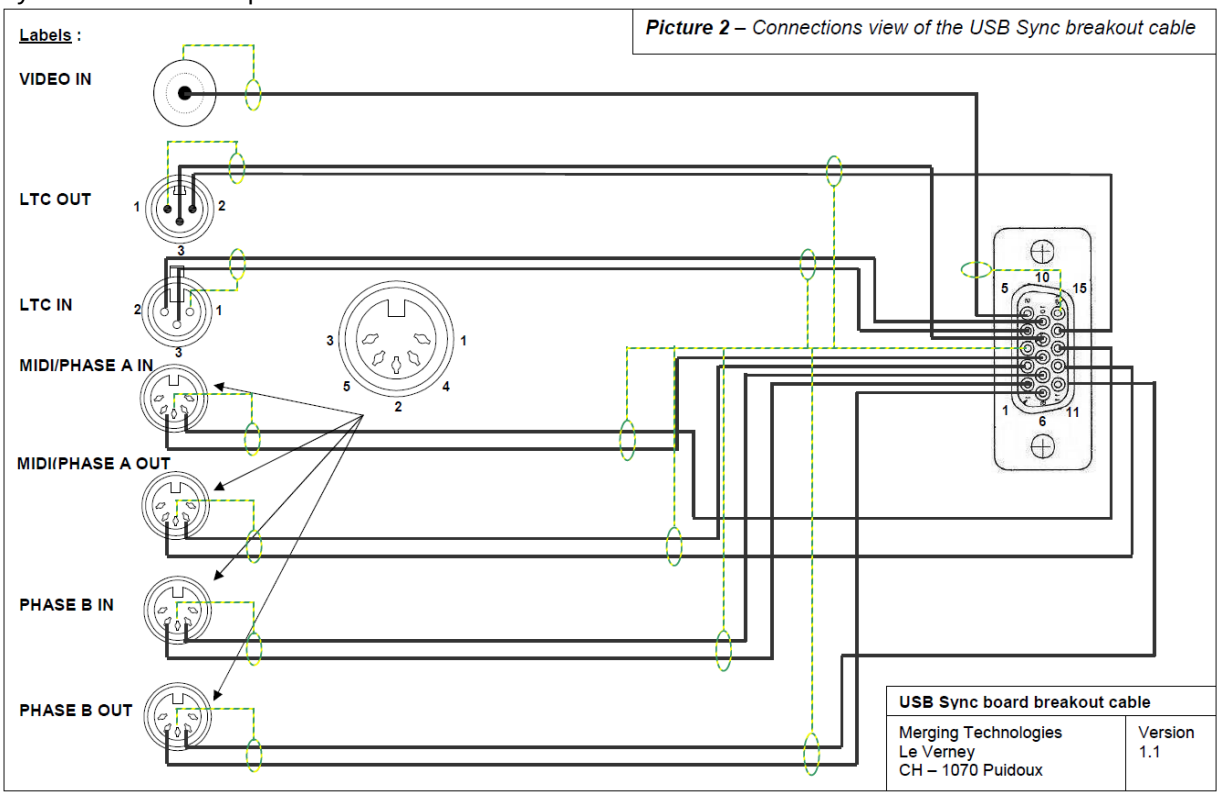
The Wordclock connections on the rear of the Hapi unit are coaxial BNC's. To connect a ordclock source from an external device slowly bring the Male cable up to the female port, ensuring that the pin in the centre of the male cable lines up with the receptacle in the female port. Push the connector firmly into place and twist the sleeve clockwise until it clicks into its locked position.

Connecting the Sync Cable

The Sync Cable (optional with each Hapi unit) is a DB15 cable that connects to the "SYNC" port on the rear of the Hapi unit. The SYNC cable provides connectivity for MIDI, LTC and Video Reference Input and Output for the Hapi unit. To attach this cable to the Hapi unit, align the male connector with the female DSUB port on the module. Then, with slight pressure, guide the connector into place. Once the cable has been pushed into place, fasten the mounting screws on either side finger-tight.

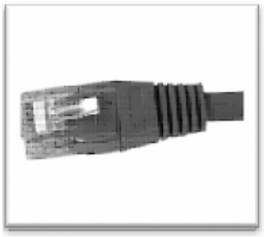


Sync breakout cable pin-out



Picture 2 – Connections view of the USB Sync breakout cable

Connecting the RAVENNA Ethernet cables



The RAVENNA ports (Primary and Secondary) are RJ45 female receptacles. Simply line up the RJ45 cable with the slot on the rear of the Hapi unit and slide it into place until it clicks into its locked position.
(Category 5E or 6)
Note: Only primary (PRI) port should be used for now (Secondary port is for network redundancy and not yet supported)

Hapi key features

Modular analog interfacing

Hapi allows the user to choose between Analog inputs and Analog outputs and MADI I/O required for each unit. Hapi provides a total of two universal I/O slots which can accept a combination of Mic/Line modules and or Line output cards and or a MADI module. Users can configure their Hapi with any combination.
For instance, in a studio environment, 8 A/D (1X IOC-AD8/P) and 8 D/A (IOC-AD8/P) will allow for 8 inputs from the live room and 8 outputs to feed studio monitoring and foldback to the artist.

Modular Device connectivity

Any of the modules listed below (A/D, D/A, MADI, AES, ADAT/SPDIF, RAVENNA) can be interconnected in any way the user chooses. Simple and easy routing pages enable the user to source signal from any module, and send it to any other combination of modules. An A/D Module could feed 8 Channels of AES Outputs. At the same time, it could feed to 8 MADI channels, or even the RAVENNA stream as well. This is the function that allows the user operate with the Hapi in either a standalone (Analog to MADI/AES AD/DA) or in RAVENNA Mode, which connects the audio to a RAVENNA network (described below).
With such a wealth of different outputs, it made sense to apply a “route to” instead of a “route from” philosophy in the way Hapi presents its routing pages. After an initial learning period, you will understand that this is a much more efficient way to present so many routing options in an easy to unfold process. So always ask yourself first which output is being considered and then decide what input signal will feed that output and you will be offered all logical and valid choices at every step. It also made sense to limit the granularity of routing options to blocks of 8 channels, as a good compromise between flexibility and complexity.

AD8 / AD8P Remote controlled Mic/Line A/D module

The AD8 (works up to 192 kHz) and the AD8P (works up to DXD/DSD256) are remote controllable, extremely high-quality Microphone pre-amplifiers with a switch on each channel to route the signal through dedicated line level circuitry instead. The remote control is achieved over Ethernet, via the RAVENNA Port at the back of the chassis. With all standard analogue controls also available via remote (Phantom power on a “per channel” basis, phase invert, HPF) and a Gain stage reaching from -10dB all the way up to +60dB, these modules are not only easy to use, but completely transparent to listen to as well.

DA8 / DA8P Safety Conscious Analogue Line output Modules

The DA8 (works at sample rates up to 192 kHz) and DA8P (works at sample rates up to DSD) are specifically designed with the user’s speakers in mind. Incorporating analogue mute circuitry, the DA8/P modules provide protection against spurious transients that may occur during Sample rate changes and power cycling “clicks” and “pops” which can damage not only speakers, but also the listener’s ears. When you add to that a noise floor of less than -125dB, these are the ultimate analog outputs for any monitoring system.

ADA8 Remote controlled Mic/Line A/D module with transparent Analog output

The ADA8 work at sample rates up to 192 kHz.

DC power supply options

Your Hapi interface can be fitted with a DC power supply input, this can be used to battery power the device or as a secondary power input.

The DC power supply option can be used in two way

1- Battery power: The Hapi can be operated from battery, or any external DC adapter provided the voltage is between 10V and 14V
2- Redundant power supply: The Hapi can be operated in a redundant way when using the standard AC power inlet and an external 12V DC adapter connected to the DC input of Hapi, in this configuration either power input can fail or be removed without creating any disruption in the device’s operation.

MADI (Module)

A MADI module is available and can be fitted in one of the Hapi slots. It provides users with up to 64 channels of MADI I/O for use with the system. The signal sent to the MADI Outputs (both Coaxial and Optical are available simultaneously) are configurable in blocks of 8 channels and can be sourced from any other module in the Hapi.
Note: Only one MADI module can be fitted per Hapi, please refer to the MADI module section above.

AES-EBU

1 x D-SUB25 connectors providing 8 channels (4 AES pairs) of AES-EBU I/O are Included as standard (as is the MADI module).

ADAT/SPDIF

8 ADAT I/O or 2 SPDIF I/O (on TOSLINK) are Included as standard. This module is supported up to 2FS (96 kHz)

Signal routing paradigm

Hapi is quite possibly the most flexible audio interface ever designed. Users can literally route any input signal to any output module. Better yet, it can route any input signal to any combination of output modules. Routable in blocks of 8 channels, a user can send 8 Mic Inputs to 8 AES outputs. At the same time these 8 mic inputs can also be sent via the MADI outputs and included in the RAVENNA stream.

RAVENNA IP Audio

Using RAVENNA IP audio, Hapi can connect to a standard network, using off the shelf switches and other IT technology to become a node on a LAN. From that point, any other RAVENNA node can receive information from and deliver information to, any combination of RAVENNA devices on the network. It is a revolution in Audio technology and will soon mean the end to costly audio routers and matrices and allow any facility an immense amount of flexibility. From Broadcast and TV/Film post-production, to music, live events, theatres, cruise ships and many more applications, the RAVENNA Enabled Hapi interface will reinvent how systems come together.

Synchronization and Control information

Audio is not the only information that can pass down the RAVENNA connection. Hapi is able to send sync and control information such as LTC/MIDI/RS-422 and GPIO down the same wire to and from the Hapi unit.

Key Specifications

Please see the sections below for the measurement performed on the circuitry inside the Hapi unit.

Hapi Modules Capabilities

Modules		AD standard	AD premium	DA standard	DA premium	ADA	Headphone	MADI	AES	ADAT	SPDIF
Sampling Rates	44.1/48kHz	√	√	√	√	√	√	√ (64 I/O)	√	√ (8 I/O)	√ (2 I/O)
	88.2/96kHz	√	√	√	√	√	√	√ (32 I/O)	√	√ (4 I/O)	√ (2 I/O)
	176.4/192kHz	√	√	√	√	√	√	√ (16 I/O)	√		
	DXD/384kHz		√		√		√	√ (8 I/O)			
	DSD64		√		√		√ *				
	DSD128		√		√		√ *				
	DSD256		√		√						

* The Headphone Monitoring gain slider for level adjustment is not supported

Hapi Modules Latencies

Modules		AD standard premium	DA standard premium	ADA Input	ADA Output	Headphone	MADI	AES	ADAT	SPDIF
Sampling Rates	44.1/48kHz	15 smpl.	12 smpl. *	16 smpl.	9 smpl. **	15 smpl.	3 smpl.	3 smpl.	3 smpl.	3 smpl.
	88.2/96kHz	10 smpl.	12 smpl. *	16 smpl.	9 smpl. **	8 smpl.	3 smpl.	3 smpl.	3 smpl.	3 smpl.
	176.4/192kHz	8 smpl.	12 smpl. *	13 smpl.	9 smpl. **	8 smpl.	3 smpl.	3 smpl.	NA	NA
	DXD/384kHz	8 smpl.	12 smpl. *	NA	NA	8 smpl.	3 smpl.	NA	NA	NA

* DA Filter setting
- Slow Roll Off Filter option = 12 Samples
- Sharp Roll Off Filter option = 39 Samples

(More details available under the DA Module chapter below)

** ADA Filter setting
- Slow Roll Off Filter option = 9 Samples
- Sharp Roll Off Filter option = 38 Samples

Installing an additional Hapi I/O Module

Installing additional Hapi I/O Cards (AD8/AD8P or DA8/DA8P)

Before you start

- Place the Hapi unit on a hard, dry surface or mount it onto a 19” rack and leave plenty of room for air convection.
- In order to meet the EMC requirements of directives 89/336/EEC and 93/68/EEC, and in order to obtain the high performance possible for the Hapi unit, you must use correctly shielded cables of good quality for all external connections when installing the Hapi unit. For the power connection, a normal unshielded power cable with a proper ground can be used.
- Make sure that your sound system is at a safe volume level.

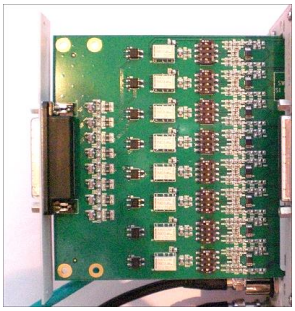
Hardware Installation

This section will take you through installation of your Hapi unit. We will describe how to mount the I/O modules and the power, audio and digital cable connections that can be accessed on the rear panel.

PLEASE ENSURE THAT YOUR HAPI UNIT IS SWITCHED OFF BEFORE ATTEMPTING TO CONNECT ANY CABLES TO THE UNIT.

If you need to mount an I/O module at a later stage, the following procedure is used.

1. Place the shutdown Hapi unit on a dry steady horizontal surface. Remove all cables (including the power cable).
2. On the back of the Hapi unit there are 2 slots for mounting the Analog I/O cards or a MADI card.
3. To remove blind plates from I/O module slots, remove the 2 screws on either side of the plate. Use a Phillips (cruciform) screwdriver tool size 2
4. Only remove the number of blind plates necessary to fit the I/O module(s). If only one I/O slot is installed, remove only 1 blind plate. If 2 I/O slots are installed, remove 2 blind plates.
5. It is very important to insert the I/O card horizontally and carefully into the Hapi unit. There are 6 set of guides inside the Hapi unit to guide the I/O cards correctly into place. Do not use force in any way to insert the I/O card. This may damage the card. Slide card slowly as picture below shows.



6. When the cover plate of the I/O card covers the hole created by removing the blind plate, the 2 screws from the blind plate are mounted in the sides of the I/O card. Tighten the screws carefully and be careful not to damage the threads.
7. After inserting the I/O module, the Hapi unit might need to be initialized. If this is the case, please follow the instructions received with the I/O module.

Installing a Hapi MADI Module (MADM or MADS are optional)

Before you get started

- Place the Hapi unit on a hard and dry surface or mount it into a 19” rack and leave plenty of room for air convection.
- In order to meet the EMC requirements of directives 89/336/EEC and 93/68/EEC, and in order to obtain the high performance possible for the Hapi unit, you must use correctly shielded cables of good quality for all external connections when installing the Hapi unit. For the power connection, a normal unshielded power cable with a proper ground can be used.
- Make sure that your sound system is at a safe volume level
- Only one MADI module card can be fitted per Hapi

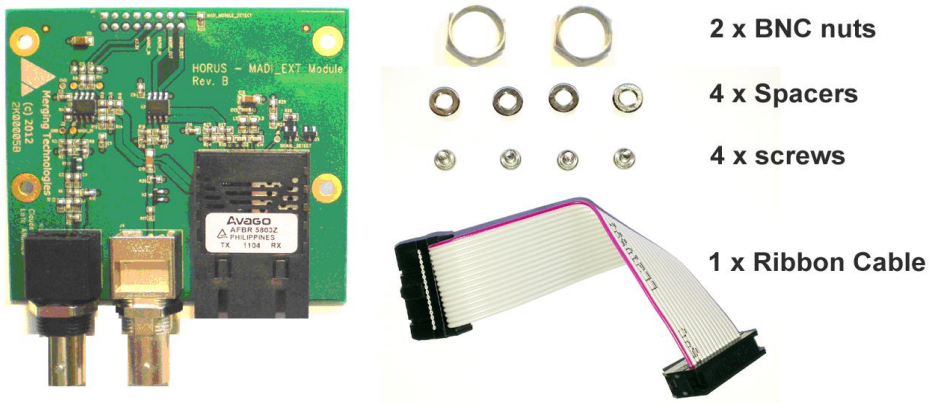
Hardware Installation

This section will take you through installation of your Hapi unit. We will describe how to mount the I/O modules and the power, audio and digital cable connections that can be accessed on the rear panel.

PLEASE ENSURE THAT YOUR HAPI UNIT IS SWITCHED OFF BEFORE ATTEMPTING TO CONNECT ANY CABLES TO THE UNIT.

Installing Hapi MADI I/O module procedure

The MADI module packaging includes the MADI module along with; two BNC nuts, four spacers, four screws, a ribbon cable and a back panel cover slot for MADI.



1. Place the Hapi unit on a dry steady horizontal surface. Remove all cables (including the power cable) and unscrew the Hapi top panel.

2. On the Back Panel first slot cover plate

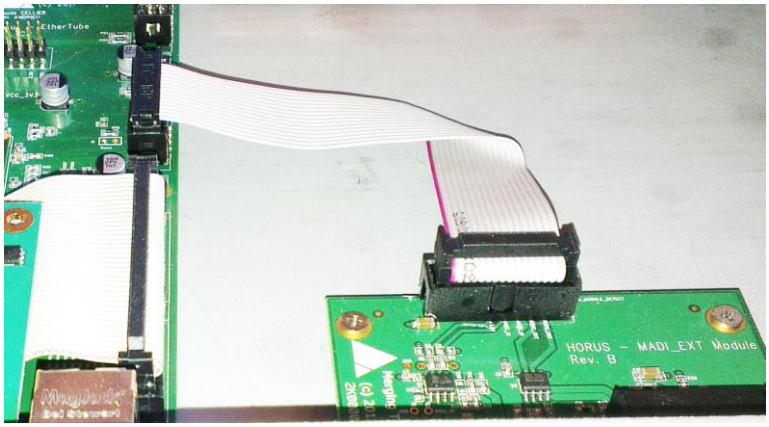
   Unscrewed 1st module (Slot 1) cover plate

3. Open the Hapi top panel

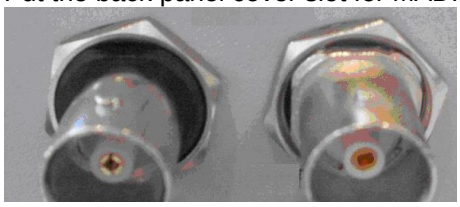
4. Screw the 4 spacers on the Hapi bottom panel

5. Slide the MADI extension board carefully so that the output connectors emerge from the Hapi back panel.

6. Align the MADI Module over the 4 spacers and screen the MADI module using the 4 screws
7. Connect the ribbon cable from the MADI module to the J8 connector on the Main Hapi board



8. Put the back panel cover slot for MADI and screw the 2 nuts onto the I/O BNC connectors.



9. Replace any modules that were removed earlier to provide access
10. Close the Hapi top panel cover and replace the fixing screws
11. Power the Hapi back on and the MADI module will be recognized

Assembling the rack mount ears

Hapi is delivered with two rack mount ears for easy installation into a 19” rack.
The ears can be mounted either on the front or the rear of the device.

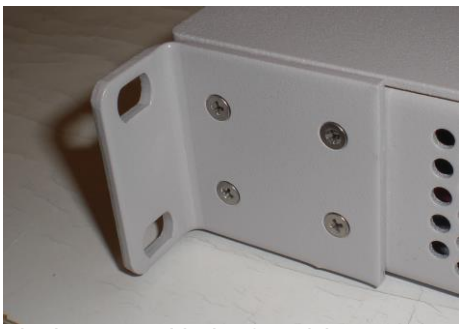
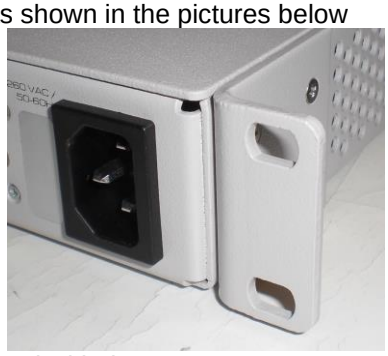
Installing the rack mount ears on the front panel

1. Turn off and unplug your Hapi
2. Unscrew the eight (8) M3x5 screws located on the side of the device (4 screws per side)
3. Place the rack mount ears on the side of Hapi, as shown in the pictures below

4. Fix the ears with the four (4) M3x8 screws delivered with the ears

Installing the rack mount ears on the rear panel

1. Turn off and unplug your Hapi
2. Place the rack mount ears on the side of Hapi, as shown in the pictures below

3. Fix the ears with the four (4) M3x8 screws delivered with the ears

Hapi recommended placement in Rack

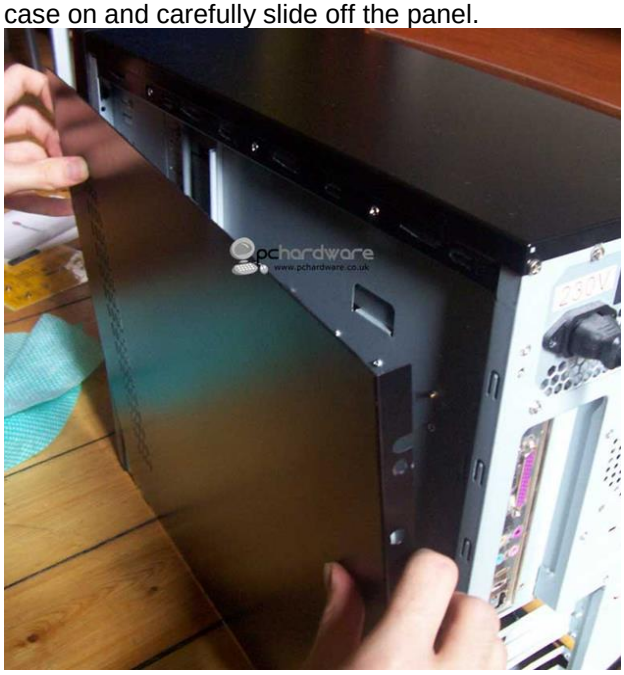
Due to confined space in a Rack furniture, adequate spacing (and ordering) between multiple Hapi or Horus units will play a significant role on the units temperature. Although Merging has spent considerable time in optimizing the Hapi power consumption in every aspect possible, the units are still drawing an average of 30W. The dissipation of the related heat produced by this consumption is therefore highly dependent on the airflow and natural air convection around those units.

With highly loaded Horus units (more than 3 I/O Analog modules per unit) or Hapi units (2 I/O Analog modules per unit), Merging recommends a free space of 1U above each unit to ensure adequate cooling of the devices, if no other heating elements are present.

Installing the Merging PCIe Ethernet Controller Card NET-MSC-GBEX1

Detailed steps on how to install the NET-MSC-GBEX1 PCIe card in your PC.

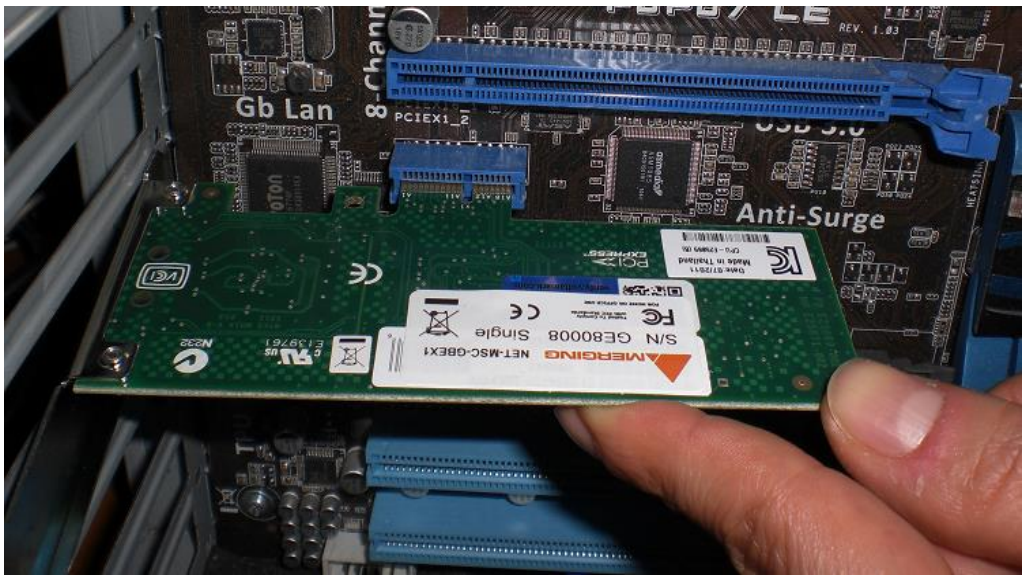
1. Power down your PC and switch it off at the wall. Remove the screws holding the top or side of the case on and carefully slide off the panel.



2. Wearing an anti-static wristband is desirable whenever working with sensitive electrical equipment. Keeping one hand on a metal part of the case will have the same effect, though you may need both hands when installing certain items of hardware.

3. Locate an empty PCIe slot and remove the metal backing plate by removing the screw holding it in place and carefully sliding it up and out. In some cases, there are no backing plates and you will need to remove a length of metal instead. Do this using a flat-blade screwdriver and/or pliers, taking care to avoid any sharp edges left behind.

4. Next, remove the NET-MSC-GBEX1 card from its envelope bag and line it up with the vacant PCIe slot as shown below.



5. Push down gently at first, ensuring you have the pins lined up correctly with the slot, and then apply more force to slot the card home fully.

6. Use the screw which held the backing plate in place to secure the card and check that the card sits properly.
Finally, replace the case cover(s) and plug your machine back in.

6. At “First Power Up” Windows will discover the Merging Ethernet PCIe card

***Note*:** Refer to the Merging RAVENNA Configuration Guide for more details on the Pyramix MassCore-RAVENNA setup

Hapi power ON

Connecting the Power Cable
The Hapi unit runs on 85-240V, 50-60 Hz AC voltage. Excessive voltages can seriously damage the Hapi unit, so make sure that your AC power matches the voltage of your Hapi unit. When you connect the power, use the cable you received with your Hapi unit and plug it into a grounded outlet.
For safety and EMC reasons, and to prevent audio hum, the system must be properly grounded. If your power source does not have a standard three-prong socket, the system must be grounded in another appropriate manner.

As an option Hapi can also be powered from a DC power source (10-14V), contact your local reseller about this option.

Hapi DC power input
Hapi can be delivered with a DC input capability, when this option is ordered a 4 pins connector (HR10A-7R-4S) is installed left to the AC power connector.
The pinout of this connector is:

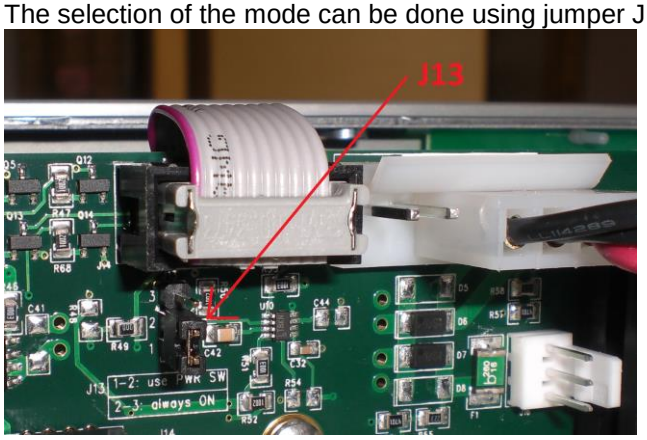
- Pin 1: GND
- Pin 4: 12V
- Pins 2 and 3: not connected

The DC power input accepts voltages from 10V to 14V for a maximum power consumption of 30W. Merging does also provide an external AC/DC 30W converter with the appropriate counter-part connector already mounted as an option.

Hapi power up mode selection
The Hapi unit has been designed to have two power up modes selectable with a jumper on the backplane of Hapi:

- Normal operation: Requires to press on the power button to turn ON Hapi, pressing for more than 5 seconds on the same button will shut down Hapi
- Always ON operation: As soon as power inlet cable is plugged in the Hapi will power ON, pressing on the power button to either turn it on of off will have no effect

The selection of the mode can be done using jumper J13 on the backplane of Hapi.



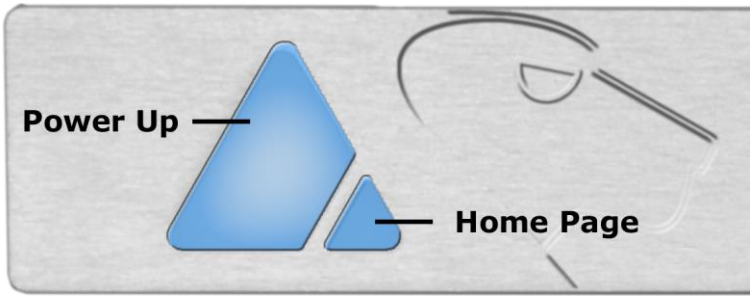
Jumper J13 pinout:

- 1-2: normal operation
- 2-3: always ON operation

The default ex-factory setting is normal mode

Turn ON your Hapi

1. Press the Hapi Front Panel Power Button



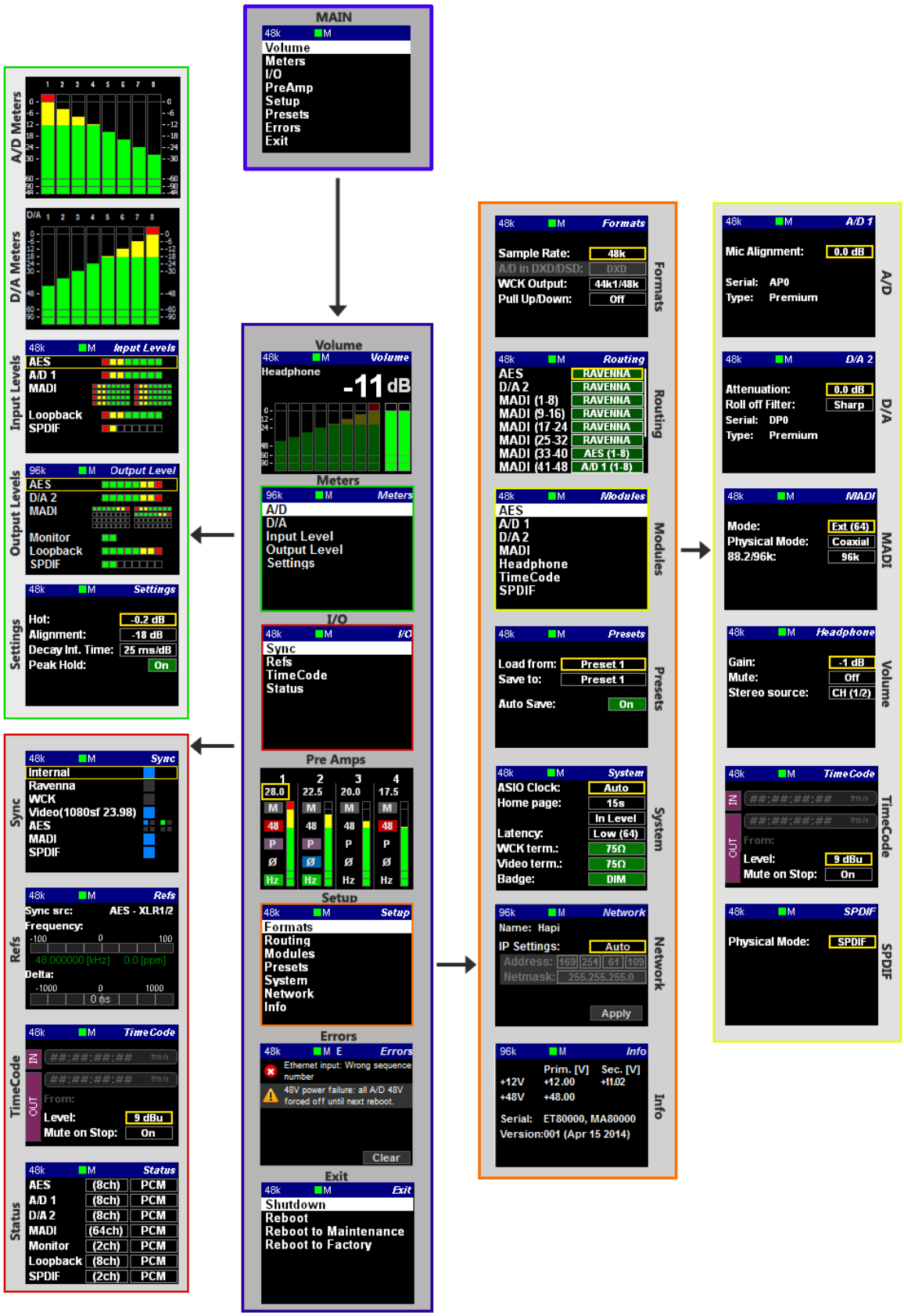
Note: Pressing the power button while also pressing down the small triangle Home Page button will start up in Maintenance Mode, such mode is necessary for firmware updates only.

2. The Hapi front panel button will turn on. If the panel button light isn't steady but appears to flicker, this may indicate a fault condition and requires immediate shut down.

3. Wait until the Hapi is fully started and displaying the Main Home screen.

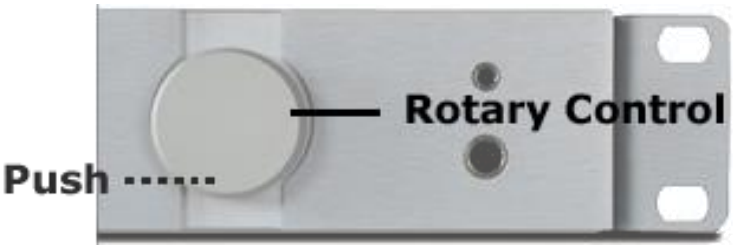
Hapi OLED screen interface

Hapi Menu Hierarchy



Screen navigation

The Main Rotary Control gives the user control over the Hapi OLED screen navigation



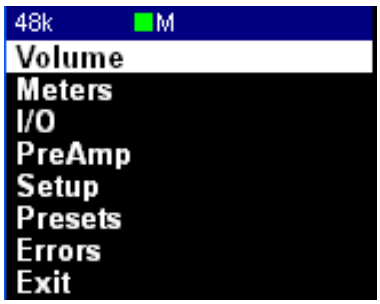
The Rotary Control: The Rotary Control wheel when turned from right to left navigates through the available menu, to confirm a Menu entry Push the Rotary Control button. This will either open a sub-menu or confirm an entered value.
The Main Rotary Control also gives the user control on the volume level of the monitoring (Headphone or DA) or the gain level of a selected Mic PreAmp channel.

Push: Pushing the Rotary button will confirm the menu entry selection or confirm an entered value.

Long Push: In order to return to the previous screen keep the Rotary Control pushed for 1 sec. Keeping the Rotary Control Pushed for a longer period will bring you back to the Hapi Main Home screen

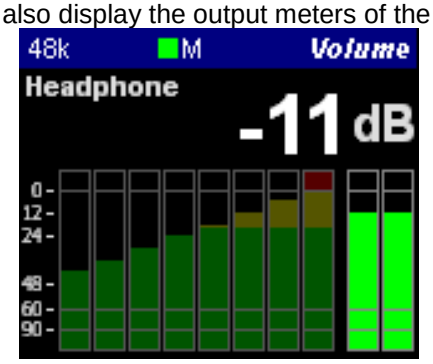
Home Screen

This is the screen which you will see after the Hapi completes its boot sequence. From here you can navigate to all the other menus for the setup and use of Hapi. If at any time you want to return to the Home Screen, you can press and hold the Main Rotary Control button for a second in order to return to the Home Screen. The screen also has access to the 8 main sections of the Hapi menu: **Volume, Meters, I/O, PreAmp, Setup, Presets, Errors** and **Exit.**

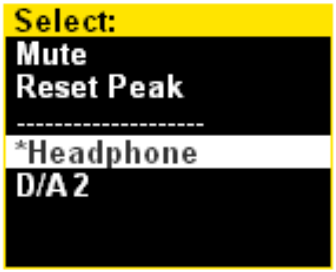


Volume Menu

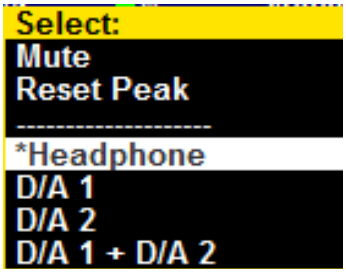
The Volume menu is where the user can determine the analog output module which will be controlled by the Hapi Rotary Control. It will also display the output meters of the selected module.



Pressing the Hapi Rotary Control button allows user to select the which analog Module will be volume controllable

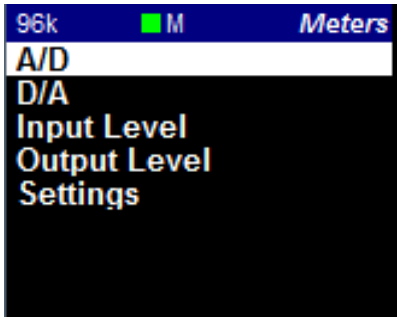


If you have multiple DA and would like to have both of them controlled by the Volume button simply select the DA1 + DA2 entry



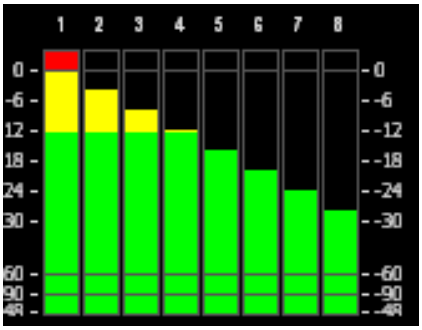
Meters Menu

The Meters menu is where the user can view the metering of the Hapi available modules.



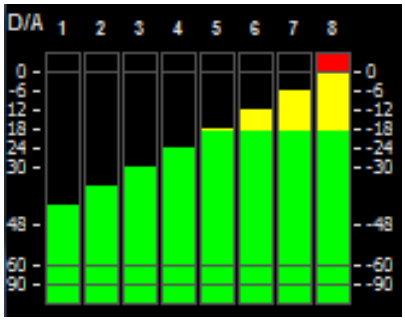
A/D Meters Sub-Menu (Meters)

The A/D meters page displays a VU meter for each A/D Input available. If you have 1 x A/D module you will see 8 VU meters and with 2 x A/D modules you will see 16 VU meters, one for each physical input.



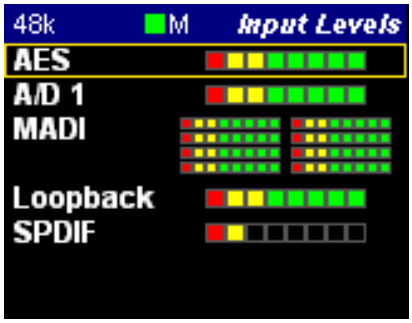
D/A Meters Sub-Menu (Meters)

The D/A meters page will display a VU meter for each D/A output available. If you have 1 x D/A module you will see 8 VU meters, if you have 2 x D/A modules you will see 16 VU meters, so one for each physical output.



Input Levels Sub-Menu (Meters)

The Input Meters page will display the input metering of the modules present in the Hapi. A metering view of one Led per input channel is represented in this page.



LED indications:

Peak indication

Alignment range

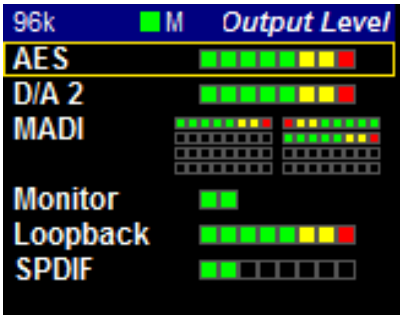
Signal indicator

The LEDs indicate the inputs levels of the AD1 inputs 1 to 8

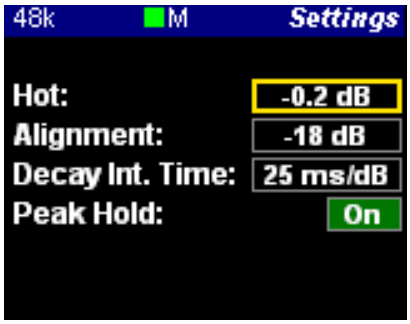
Note: You can reset a module Peak by pressing the Rotary Control. In the example above pressing A/D 1(8ch) will reset the peak displayed on the input 1 This led view ledged also applies to the DA view.

Output Levels Sub-Menu (Meters)

The Output Meters page will display the Output metering of the modules present in the Hapi. A metering view of one Led per output channel is represented in this page.



Meters Settings Menu

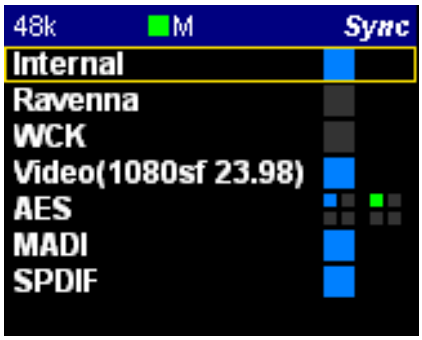


Hot:	Sets the level above which the meter display will be red. If set to 0dB this will mean clipping. Range -2dBFS to 0dBFS
Alignment:	Sets metering level alignment range (yellow leds). Range -24dBFS to 0dB
Decay integration time:	Sets the rate at which the level meter display decays after the level falls below the most recent Peak.
Peak Hold:	If ON it will keep the red Peak Hold Overload in display

I/O Menu

Sync Sub-Menu (I/O)

The IO and Synchronization menu is where the user can select the source of the Hapi reference clock. It is essential that these settings are configured correctly in order to ensure a clean audio signal through the Hapi unit.



Reference Source	Choose the desired sync source by selecting a Reference source. Available Reference Sources are: RAVENNA, WordClock, MADI, AES or SPDIF
Reference navigation	Selecting a Reference with multiple choices (such as Sync or AES) will enable the source navigation. The navigation is performed from top to bottom and will cycle through in this order at each consecutive press. The selection of another Reference Source will re-select the top entry in the list by default.

PTP Clock

The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a computer network. Also known as IEEE 1588, it is a protocol designed to synchronize real-time clocks in the nodes of a distributed system that communicates using a network. RAVENNA is based on and uses V2 of this IEEE standardized protocol. PTP Clocks allow for time resolution to the Nanosecond.

M Master: indicates that the current Hapi is the PTP Master

S Slave: The Hapi is slave to another PTP Master

The Hapi will always try to be the PTP Master. If multiple Hapi' or Horus' are used in a network environment, the Hapi set in this order will have the PTP Master priority, using the Best Master Clock Algorithm (BMCA):

1. Video sync
2. Word Clock
3. AES
4. ADAT/SPDIF
5. MADI
6. Internal
7. RAVENNA (always slave unless there is no PTP master available)

Sync Color table:

	Dark Blue:	Signal present		Red:	Unlocked
	Light Blue:	Signal valid		Yellow:	Locking
	Black:	No Signal		Green:	Locked

Note: When two or more Hapi are connected together through an Ethernet network, one of them will always be automatically selected as master, the other Hapi' will be forced into slave state and therefore will not be synchronized to wordclock or audio input. However, this is not a problem since all Hapi' will be synchronized.

Status:

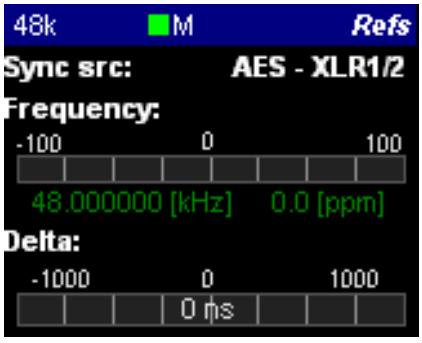
LTC IN: Corresponds to the incoming LTC frame rate

Hapi PTP status: MASTER or SLAVE

Video Format Detected:
Supported Formats:
PAL – NTSC
720p23.98– 720p24 – 720p25 – 720p29.97 – 720p30
720p50 – 720p59.94 – 720p60 (not recommended video formats)
1080i25 – 1080i29.97 – 1080i30
1080sf25 – 1080sf29.97 – 1080sf30
1080p23.98 – 1080p24 – 1080p25 – 1080p29.97 – 1080p30

Refs Sub-Menu (I/O)

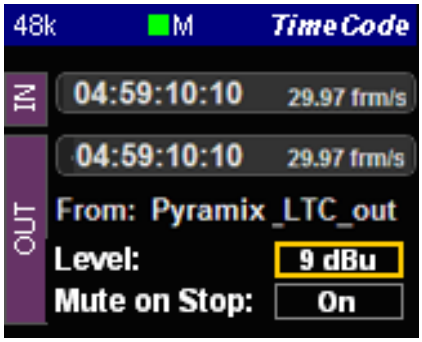
This Sub Page menu is where you can view the Deviation and Jitter of the External Reference, as measured by the Hapi synchronization circuitry.



Frequency: The long-term measured Frequency (in Hz) and deviation in ppm (parts per million) between the signal the unit is locked on to and the internal reference.

Delta: The short-term (instantaneous) time offset between the reference signal and the internal (considered as ideal) reference, measured in nanoseconds (ns). In other words, the delta indicator over a RAVENNA network will report the delta in ns between the master and the slave.

Timecode Sub-Menu (I/O)



IN Timecode: Will display the current incoming LTC/Timecode

OUT Timecode: Will display outcoming LTC/Timecode

Frame Rate: The current LTC/Timecode Frame Rate is indicated next to the Timecode IN & OUT display

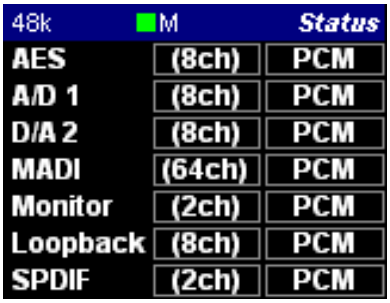
From: Indicates the Timecode provider (in example above the Pyramix DAW)

Timecode Level: Shows the current LTC output level in dBu. The selector offers a choice of output level from -18dBu to +9dBu in 3dBu increments, or can be switched off

Mute on Stop: If OFF the LTC output will not be active (default)
If ON the LTC output is generated constantly

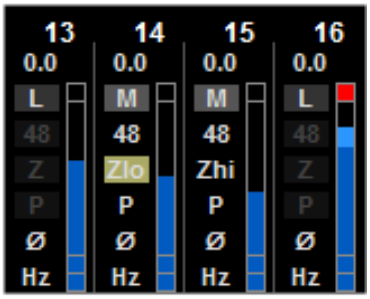
Status Sub-Menu (I/O)

Lists the status of each Module
Channel count (I/O) and each module Mode (Example: PCM or DSD modes)



PreAmp Menu

The PREAMP (A/D) menu becomes active if you have 1 or more AD8(P) modules installed in the Hapi unit, giving full access to the Input controls. Please see below for a description of the buttons available.



All	Active: Will select all 8 input channels for function and level grouping Inactive: Adjustments to the input settings and level affect only the selected channel only Note the All button will group all inputs of the same type (Mic or Line)
Gain	The Rotary Control will give the user control over the Gain level with increments/decrements in 0.5 dB steps The Gain range goes from 0 dB to +66.0 dB from left to right In Mic mode (M): Sets the Mic Preamplifier's Gain In Line mode (L): Sets the Line Input Sensitivity A value of 0dB corresponds to an input sensitivity of +24dBu for 0dBFS A value of +20.0 dB corresponds to an input sensitivity of +4dBu for 0dBFS A value of +66.0 dB corresponds to an input sensitivity of -42.0dBu for 0dBFS
Mic (M) or Line (L)	Switches the Input from the Mic-Pre amplifier to the Line level circuitry. The button will show the current input signal path it is set for (Mic or Line). The Line input sensitivity can be adjusted be setting the line gain for each input of the AD module. Line Fader of 0 dB, means 0 dBFS for +24 dBu Analog signal level present at the Line input Line Fader of + 6 dB, means 0 dBFS for +18 dBu Analog signal level present at the Line input Line Fader of + 20 dB, means 0 dBFS for +4 dBu Analog signal level present at the Line input Line Fader of + 66 dB, means 0 dBFS for -42 dBu Analog signal level present at the Line input *Note #1: the MIC and Line inputs are not coupled, meaning that switching from Mic to Line and vice versa will load its own gain (sensitivity) value* *Note #2: The Premium AD converters of Hapi have been designed in order to be able to benefit from the +3.1 dB SA-CD headroom offered by DSD, as per the scarlet book standard. Therefore a minimum of +6 dB gain is required on the mic preamp or line input. This gain is applied immediately when the ADs are switched to DSD (64, 128, 256FS) and is visible in the preamp page. The gain can be adjusted between +6dB and +66dB in DSD mode. In Line mode, with a gain of +6dB, an input of +24dBu will generate a signal of +6dB SA-CD, in Mic mode, with the same gain, an input of +13dBu would generate a signal of +6dB SA-CD.* *To benefit also from this +6dB headroom in DSD on the DA outputs of Hapi, we recommend our users to set the level alignment to -6dB on each DA module configuration page.*

48V

This button will turn on 48V phantom power for the channel. If it is lit, it means that Phantom power is active. Only active on channels set to Mic.

If a MAJOR (by MAJOR, we mean that the threshold of short-circuit detection requires at least 10 Preamp inputs to be shorted simultaneously) 48V Phantom Power Supply short circuit is detected, 48V is forced off on all A/D channels and the following error message is displayed.
"48V power failure: all A/D 48V forced off until next reboot"

This warning applies ONLY to the initial RUN 3 production batch of AD8 and AD8P and has been fixed for all modules shipped starting November 2012:
The 48V power MUST be turned off prior to changing the connection in certain patch bays. Many such patch bays do short the Hot, Cold or both signals to Ground during insertion or removal of the Jacks with the risk of deteriorating permanently the protective resistors in the input of the PreAmp circuitry. If an AD module input circuitry is damaged, following such a short, it will end up permanently having inaccurate gain levels, distortion or even no signal at all on some channels. That would require hardware replacements at your own cost, since such damage is not covered by our warranty.
If you still own one of the original and unmodified RUN 3 AD8/AD8P modules we recommend that you contact your Merging reseller to organize an update of your module(s), which Merging is pleased to provide free of charge.

Zlo – Zhi

Mic input impedance (only available for ADA8 modules)

	48V Phantom	
	Disabled	Enabled
Zlo	2 kΩ	1.7 kΩ
Zhi	13.6 kΩ	6.8 kΩ

PAD (P)

A -10 dB Pad can be applied inserted in the Mic Preamp circuitry.

Ø

Phase invert button. When lit, it inverts the polarity of the selected input signal.

80 Hz (Hz)

Low cut filter 80 Hz. Second order, 12 dB/octave.

Meters dB scaling

The Meters scaling is displaying from -90 dBFS to 0 dBFS.

Meters color range

Refer to the Meters Page Settings, in order to adjust the Level meter color range (Peak, Alignment and Decay time).

Rst

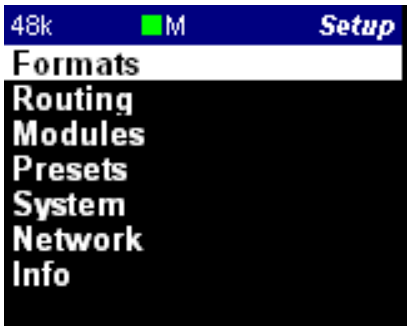
Stands for Reset Peaks Hold Meters. The top Red led of the PreAmp metering will indicate that a Peak has occurred. In order to clear the Peak display, simply press the RST button. This is useful if you have enabled the Peak Hold option under the Meters menu Settings

Navigation

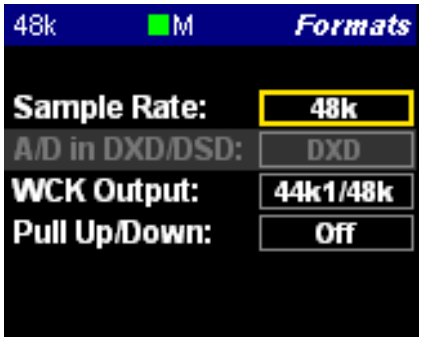
Use the left << and right >> arrows in order to navigate through the banks of 8 inputs. Will be active if more than one AD8(P) module is present in the unit.

Setup Menu

The Setup menu's primary page contains function buttons described below as well as sub-menu links listed in the sub-sections; **Formats, Routing, Modules, Presets, System, Network and Info**



Formats Menu (Setup)



Sample Rate: Select the Hapi Sampling Rate
44.1 kHz - 48 kHz - 88.2 kHz - 176.4 kHz - 192 kHz - 384 kHz – DXD/DSD
Note: The available Sampling Rates depend on the Hapi Analog module cards. Only Premium Analog modules offer support beyond 192 kHz.

A/D Mode in DXD/DSD: This format setup only applies to the AD module which can be set to either DXD - DSD64 - DSD128 - DSD256
Note: The Hapi can be configured in DXD/DSD and in this mode the Hapi can receive any audio data format stream and can generate DXD or DSD(64, 128 or 256) stream depending on the A/D audio data format chosen.

WordClock Output: 44k1 / 48k: When enabled the Wordclock Output will be at either 44.1kHz or 48kHz
Example:
Sampling Rate: 44k1/88k2/176k4 the WordClock Output will be 44.1kHz
Sampling Rate: 44k/96k/192k the WordClock Output will be 48kHz.

Follow SR: When enabled the WordClock Ouput will follow the Sampling Rate selected.
Example:
If the selected Sampling Rate is 48k the WordClock output will be at 48kHz
If the selected Sampling Rate is 176k4 the WordClock output will be 176.4kHz

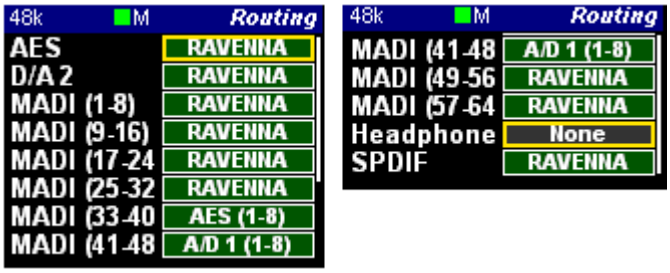
Pull Up/Down: Slow down or accelerate audio clock by 0.1 % depending of the frame rate of the video reference.
This option will only be active if the sync source is configured to Video Ref.
The Status of this option can be viewed in the IO&Sync page under Status
- Off: Normal operating mode
- Up: Accelerate the clock by 0.1%. Supported only with a Video reference at 24fps and 30fps

- Down: Slowdown the clock by 0.1%. Supported only with a Video reference at 23.98fps and 29.97fps

Auto — Auto Sampling Rate mode. Hapi will automatically follow the sampling rate given by the Drivers (e.g ASIO).
Example users using an external player (jRiver) could use this Auto mode so that their Hapi follows the sampling rate of the media file played and switch automatically to different sampling rates.
It can also be enabled for using running the RAVENNA ASIO Driver, so that Horus adapts automatically its sampling rate.

Routing Menu (Setup)

Module routing menu describes where the signal for each module in the Hapi is coming from. Each button leads to a sub-menu that allows the user to change the source of the signal to that specific module. For instance, the Headphone in the Routing menu will allow the user to change the routing of the Headphone.
Choices are made in blocks of 8 channels (except for the Monitor, which is a Stereo signal).

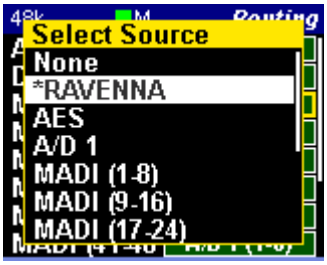


ADAT: Takes you to the ADAT Routing configuration page (refer below)
AES: Takes you to the AES Routing configuration page (refer below)
D/A: Takes you to the D/A Routing configuration page (refer below)
MADI: Takes you to the MADI Routing configuration page (refer below)
HEADPHONE: Takes you to the Headphone Routing configuration page (refer below)
SPDIF: Takes you to the SPDIF Routing configuration page (refer below)

A/D: Disabled as one cannot route TO an Input!
Loopback: Takes you to the Loopback module (present only in debug mode)

Routing: Source Configuration

ADAT – AES - D/A - MADI – SPDIF Routing Output Source (similar)



For all of the output modules (ADAT/SPDIF,AES, D/A N, MADI & Headphone Jack) the user can set where the signal feeding it comes from. Any combination is possible using the Output source page linked to any of the output modules.
* All routing in the Hapi is currently achieved using banks of 8 channels*

None: Sets the module so that it does not receive a signal from anywhere. Digital Mute will be output.

RAVENNA: Connects the module to the RAVENNA network and allows any other RAVENNA device to send signal to it.

ADAT/SPDIF: Sets the module being configured to receive signal from the ADAT/SPDIF

AES: Sets the module being configured to receive signal from a bank of AES-EBU inputs.

MADI: Enables the module being configured to receive signal from any 8-channel bank in either of the MADI streams

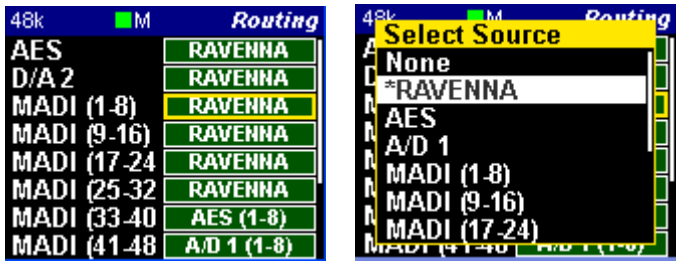
A/D N: Sends the signal coming in from the Mic or Line input modules to the output module being configured

Loopback: Should only be used for test purposes.

Routing Example:

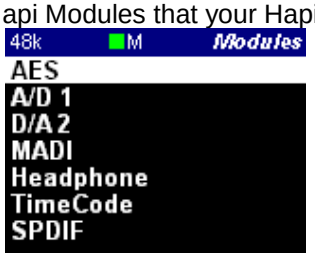
MADI Routing Output: Users can route literally any input signal to any output module. Users can also route any input signal to any combination of output modules. Signals are routable in blocks of 8 channels.

The example picture below shows a MADI output routing being selected from the Routing page on the MADI module channels 1-8



Modules Menu (Setup)

Module menu will show the available Hapi Modules that your Hapi has in its configuration



Selecting one of the Modules described below will open the Module I/O configuration menu

AES
Included as standard. The AES buttons are active since this module is included as standard. Connectivity is over 1 D-SUB25 connectors providing 8 channels (4 AES pairs) of AES-EBU I/O.

A/D N
The A/D buttons, which become active if you have 1 or more AD8(P) modules installed in the Hapi unit, give access to the Input controls. N being a number incrementing from 1 to 2. Please see below for a description of the buttons available.

ADA N
The ADA buttons, which become active if you have 1 or more ADA8 modules installed in the Hapi unit, give access to the Input controls.

D/A N
The D/A buttons become active when 1 or more IOC-DA8(P) modules are installed in the Hapi unit.

MADI
MADI module is optional with each Hapi. Only one MADI module can be fitted per Hapi.

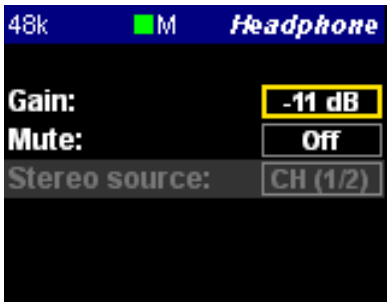
Headphone
Shortcut to the Headphone monitor page described above.

TimeCode
Included as standard. The TimeCode button is active since this module is included as standard and will bring you to the TimeCode page.

ADAT/SPDIF
ADAT/SPDIF module is included as standard with each Hapi.

Heaphone Menu

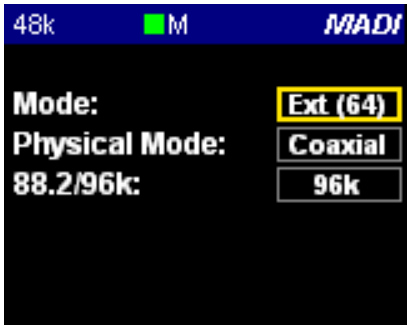
The Headphone menu refers to the Hapi front panel Headphone Monitor jacks. The Headphone jacks 1 & 2 (6.3 mm and 3.5 mm) output the same source and level.



Headphone gain:	Sets the gain of the Headphone output. By selecting (Rotary Push) the Gain entry and using the Hapi Rotary Control (Left= less gain / Right= more gain) to set the gain to the desired level Headphone level range: -60 dB to +12 dB
Headphone Mute:	Mutes the headphone output when OFF is active
Channel selector	The Monitor (headphones) being a Stereo output it is possible to select which pair of channels you want to monitor (1-2, 3-4, 5-6 or 7-8)

Modules: MADI Sub-Menu

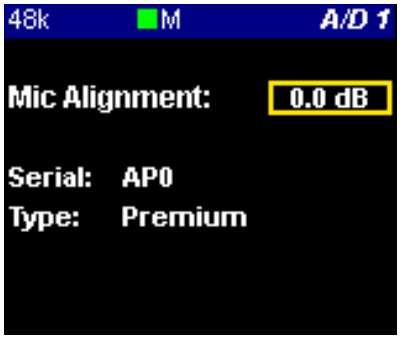
MADI module is optional with each Hapi.



Mode:	Sets the MADI mode to either “Standard” (56 audio channels) or “Extended” (64 channels). To determine which setting(s) you are able to use, please consult the user manual of the device you are connecting the Hapi to in order to see which (if not both) formats it complies with. *Note: MADI Standard (56) can only be enabled at 1FS (44.1kHz/48kHz) above 1FS we will automatically revert to MADI Extended (64).*
Physical Mode:	Choose the input signal to be derived from the Coaxial or Optical MADI connections at the back of the Hapi unit. You can choose to use either or, but not both at the same time. On the Output side, however, both Coaxial and Optical outputs are always driven in parallel.
88.2/96k:	Choose between using 48k Frame (Legacy) or 96K Frame (High-speed). This option is only available for MADI output at 88.2/96kHz sampling rate and is dependent of the device used in conjunction with the Hapi. For information on why you might want to set this to something other than Legacy/48K Frame, please consult the user manual of the device you are connecting Hapi to.

Note: Mykerinos users who are connected to the Hapi should configure their Mykerinos Pyramix general settings so that the MADI High Speed mode is disabled and then set the Hapi to 48k Frame (legacy).

Modules: A/D Sub-Menu



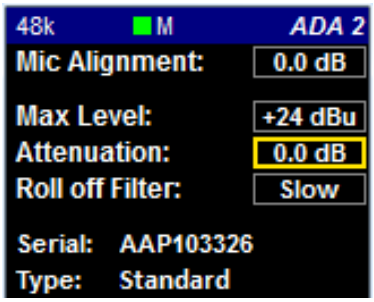
Mic Alignment: User can offset the Mic Gain Alignment scaling from a Range of 0dB to +12dB.

Example: Setting a gain alignment of +10dB will make the Hapi, Web Access or the Pyramix PreAmps control to be offset by a scaling of +10 dB.

Serial Number: This is the place you can access all your Modules serial numbers without having to unslot them or open the box

Type: Module Type description (Example : Premium Direct Out)

Modules: ADA Sub-Menu



Mic Alignment: User can offset the Mic Gain Alignment scaling from a Range of 0dB to +12dB.

Example: Setting a gain alignment of +10dB will make the Hapi, Web Access or the Pyramix PreAmps control to be offset by a scaling of +10 dB.

Max Level Maximum Output Level: +18 dBu or +24 dBu

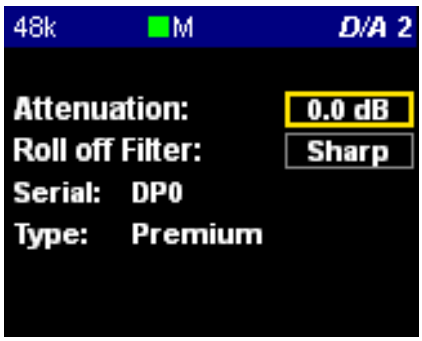
Output attenuation: Calibration of the D/A output (Range -60.0 dB to 0 dB).
Refer to the Hardware section for the D/A onboard output level calibration.

Roll Off Filter: Sharp roll-off filter: Offers a flat frequency response up to 22kHz, within 0.2dB, which has the tradeoff of 36 samples latency. This mode was and still is the default one.
Slow roll-off filter: Offers a low latency of 9 samples, with the tradeoff of a gentle frequency response attenuation starting around 16kHz and reaching -2.5dB at 22kHz

Serial Number: This is the place you can access all your Modules serial numbers without having to unslot them or open the box

Type: Module Type description

Modules: D/A Sub-Menu



Output attenuation: Calibration of the D/A output (Range -60.0 dB to 0 dB).
Refer to the Hardware section for the D/A onboard output level calibration.

Roll Off Filter: Sharp roll-off filter: Offers a flat frequency response up to 22kHz, within 0.2dB, which has the tradeoff of 36 samples latency. This mode was and still is the default one.
Slow roll-off filter: Offers a low latency of 9 samples, with the tradeoff of a gentle frequency response attenuation starting around 16kHz and reaching -2.5dB at 22kHz

Serial Number: Module serial numbers

Type: Module Type description

Modules: Loopback (hidden menu, available only for debug use)

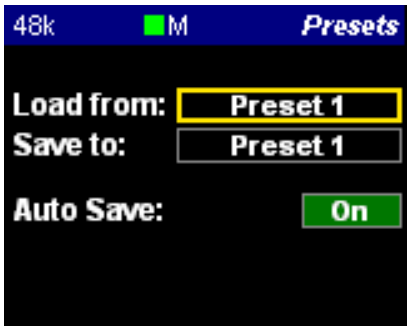
Transparency Check: This is a Debug Utility tool that verifies the bit transparency of the audio path
On: Transparency check enabled
Off: Loopback mode enabled

Word Length: Word length of the digital audio data signal (16 bits or 24 bits)

Status: Green: Path transparency valid
Black: Path is not transparent
Numbering: indicates the number of discontinuities measured

Latency: Output to Input delay in samples

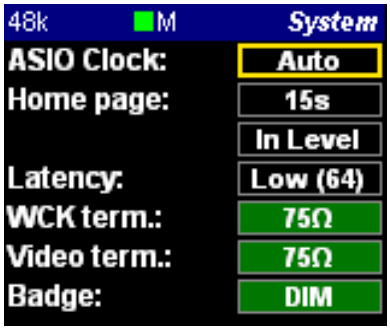
Presets Menu (Setup)



Load:	5 presets banks of different Hapi configurations can be loaded (one at a time)
Save:	5 presets banks are available to store different Hapi configurations
Auto Save:	If enabled the save configuration will happen at every 2 minutes.

Note: Since the flash memory which is at the heart of the Hapi storage has a huge (but not infinite) amount of write cycles, we limit the auto-save of all configuration and PreAmps settings to once every two minutes if (and only if) a change has occurred meanwhile.
Furthermore, both Shutdown and Reboot buttons (in Setup page) do also entirely save the current configuration of the Hapi prior to power down.

System (Setup):



ASIO Clock:

If set to Auto enabled: The ASIO clock will be generated by the Hapi which will be PTP Master.
If Auto is disabled: The ASIO clock will always be generated by this Hapi.
Note: Do not disable unless you are sure that no Hapi will be PTP Master.

Home Page:

Users can decide what will be their Hapi OLED Home Page. You can return to the Home Page by performing a long Rotary Control push or by pressing the Hapi front panel Home Page button (small Pyramid). Users can also set a Home page display delay option of; 15 seconds, 30 seconds, 1 minute or set it to Never (disabled).

A/D Metering: The screensaver redirects you to the AD Meters Page.
D/A Metering: The screensaver redirects you to the DA Meters Page.
In Levels: The screensaver redirects you to the Input Level Page.
Out Levels: The screensaver redirects you to the Output Level Page.
Volume: The screensaver redirects you to the Volume Page.

Long push the Rotary Control to exit those pages.

Screensaver: The Hapi screen will turn black after a 30min delay wihout user interaction. This is in order to preserve the life span of the Hapi OLED display. To exit the Screensaver press the Rotary Control Button or quickly press the Hapi Home Page button or Power button (Hapi front panel pyramids button).

Latency:

The Hapi has 4 Latency Settings (in samples) that will determine the device latency over a RAVENNA network. When multiple RAVENNA devices (e.g. Horus & Hapi) are connected over a network, they adjust themselves to the lowest latency that can globally be achieved.

- Ultra Low (16 smp)
- Extra Low (32 smp)
- AES 67 (48 smp)
- Low (64 smp)

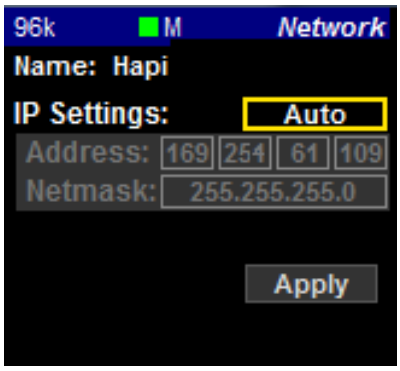
Terminations:

75Ω for WCK: Sets 75Ω termination for the Wordclock Input. Enabling this will disable the Wordclock output.
75Ω for Video: Sets 75Ω termination for the Video reference Input. Unless the Video Reference signal provided to the Hapi is daisy-chained to other equipment, you should always terminate your Video signal for most reliable operation.

Badge:

Dim active will darken the Hapi display luminosity. When active this saves some power and hence some internally generated heat.

Network Menu (Setup)



Device Name:	Name of the Hapi unit. This name will be broadcast across the network and will be seen in applications such as the MT Discovery tool. The Hapi unit name can be changed from the Web control access Network page (see section below for all details)
IP Settings:	*Manual*: Type IP address using box selection and the - or + buttons *Auto*: The IP address will be automatically attributed using ZeroConf/Auto-IP mechanism (address range 169.254.xx.xx if no DHCP server is present)
Address:	Set the IP Address for the Hapi unit by using box selection and the - or + buttons (Available only with IP Settings = Manual)
Netmask:	Set the Subnet Mask for the Hapi unit by using box selection and the < or > buttons (Available only with IP Settings = Manual)
Apply & Reboot:	Once changes have been made to this section, you must press this button to save the settings and power cycle the Hapi unit

Note:
Hapi has no DHCP-server capability neither does the Merging PCIe Ethernet Controller Card NET-MSC-GBEX1.
By default the Hapi IP setting is set to "Auto" configuration mode which gives an address in the range 169.254.xxx.xxx if no DHCP server is present on the network. Users are free to put a DHCP server in their RAVENNA network with a customized address range and the Hapi would get an IP address from this server. Note that our recommended Dell PowerConnect 2816 RAVENNA switch is configured with DHCP disabled.

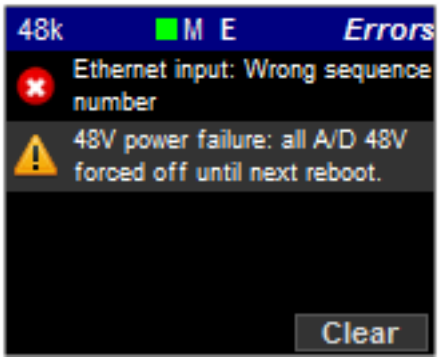
Merging recommend the Hapi to be configured in "Auto" mode and the Merging PCIe Ethernet Controller Card NET-MSC-GBEX1 to also be configured with "Internet Protocol Version 4" with "Obtain an IP automatically".
You must be aware that when the Hapi is started in Maintenance mode the IP configuration is exclusively done using "Auto" IP settings mode.

Info (Setup):

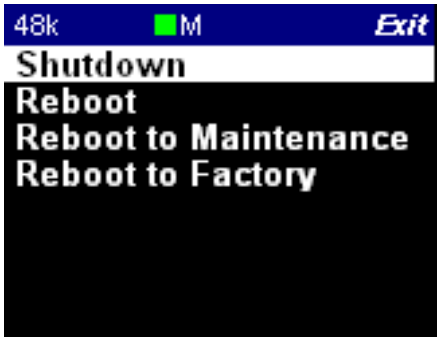
In this sub menu you will find details about the Hapi internals; current consumption, voltage, temperature, fan speed, serial number and the firmware version currently installed.

ERROR Menu

List the errors detected by the Hapi. Refer to the troubleshooting section below for details of each errors. The Clear entry will delete the listed errors.



EXIT Menu



Shutdown:	Initiates a proper shutdown of the Hapi unit, including a save of the current configuration. Do not attempt to shutdown the Hapi unit in other ways (such as using the power switch on the back of the device).
Reboot:	Power cycles the Hapi unit (shutdown>Boot up)
Reboot maintenance	Power cycles the Hapi unit (shutdown>Boot up) and restarts in Maintenance mode (required mode for Firmware upgrade)
Reboot to Factory:	If selected we will reboot the Hapi to the default factory configuration. The Current configuration will be lost but all the saved presets will be kept and can be reloaded.

Hapi Web Control access

Installing and accessing the Hapi Control interface remotely

To control and view your Hapi remotely with a web browser make sure that you are using one of the Internet browsers below: Google Chrome (Highly Recommended), Mozilla Firefox, Opera, Apple Safari. * Microsoft Internet Explorer is not supported *

Then take the following steps:

1) If you did not install Pyramix v8 or Pyramix v9 proceed from step 2 to 3. If you have already installed a Pyramix go directly to step 4)
2) Download the MTDiscovery.exe application to your system (PC or MAC installers are available) http://www.merging.com/products/horus/downloads
3) Make sure your Hapi is connected to the same network as your system, and is configured with the correct IP settings (See “Setting up the Hapi IP Address”)
4) Launch the MT Discovery tool (MTDiscovery.exe)

Any Hapi devices on the network will be discovered by the MT Discovery tool and will appear in the folder tree under “RAVENNA Devices>Hapi Devices”

- A mouse double-click on the Hapi Device entry will open the Hapi Web Interface in your default web browser
- Only Devices on the same network (same color in display) can have their I/O interconnected
- *Microsoft Internet Explorer is not recommended for this*

MT Discovery Window

Using the Webpage, you can browse the Menus and change parameters in exactly the same manner as on the front panel TFT of the Hapi unit in question.

Warning: It is mandatory that you connect the Hapi to a Gigabit Ethernet Port or Switch for remote access.

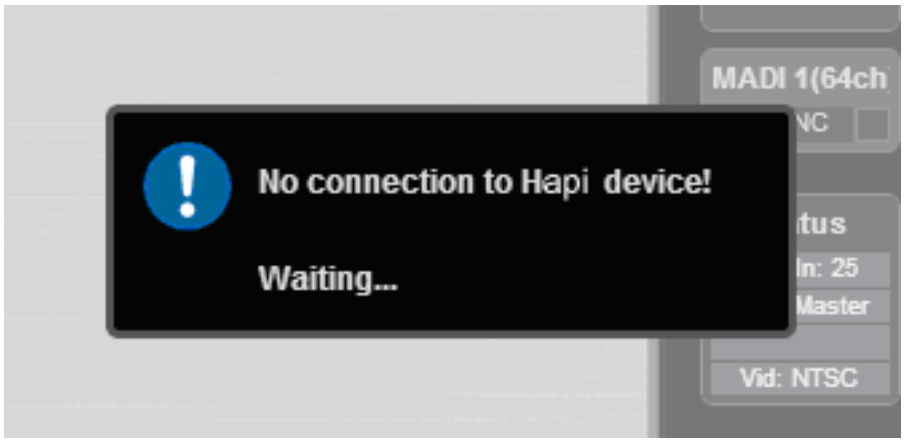
Hapi Web Access

The Web access Hapi menu pages are based on the Horus layout and differ from the Hapi OLED screen

Disconnection warning:

User will be warned it the remote web access to the Hapi become offline/disconnected.

Hapi Web Access Disconnected

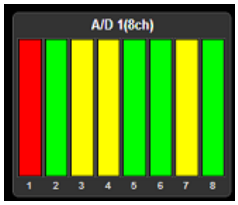


Meters web menu

The Meters web menu will display the input metering of the modules present in the Hapi

Hapi Meters Web menu

Led indications:
Peak indication
Alignment range
Signal indicator



The leds indicate the inputs levels of the AD1 inputs 1 to 8
Note: You can reset a module Peak by doing Mouse + Click on the Module display section. In the example above pressing A/D 1(8ch) will reset the peak displayed on the input 1.

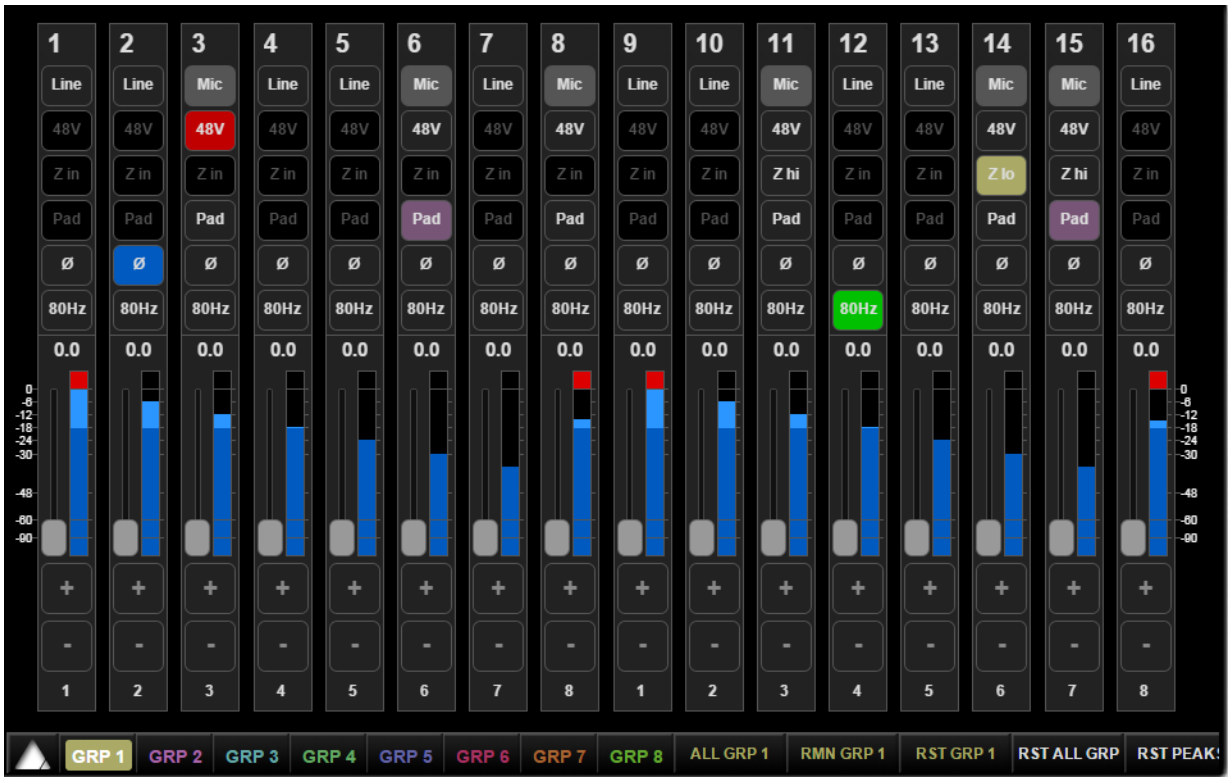
Meters web Settings:

Hot:	Sets the level above which the meter display will be red. If set to 0dB this will mean clipping. Range -2dBFS to 0dBFS
Alignment:	Sets metering level alignment range (yellow leds). Range -24dBFS to 0dB
Decay integration time:	Sets the rate at which the level meter display decays after the level falls below the most recent Peak.
Peak Hold:	If ON it will keep the red Peak Hold Overload in display

PreAmp web menu
- Allows the creation of up to 8 groups
- Naming of channels (can be saved in Hapi presets)
- VU meters

For other parameters, please refer to the PreAmps module description (above)

Hapi PreAmp Web menu


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Line Mic
48V
Z in Z hi Z lo
Pad
Ø
80Hz
0.0
GRP 1 GRP 2 GRP 3 GRP 4 GRP 5 GRP 6 GRP 7 GRP 8 ALL GRP 1 RMN GRP 1 RST GRP 1 RST ALL GRP RST PEAK

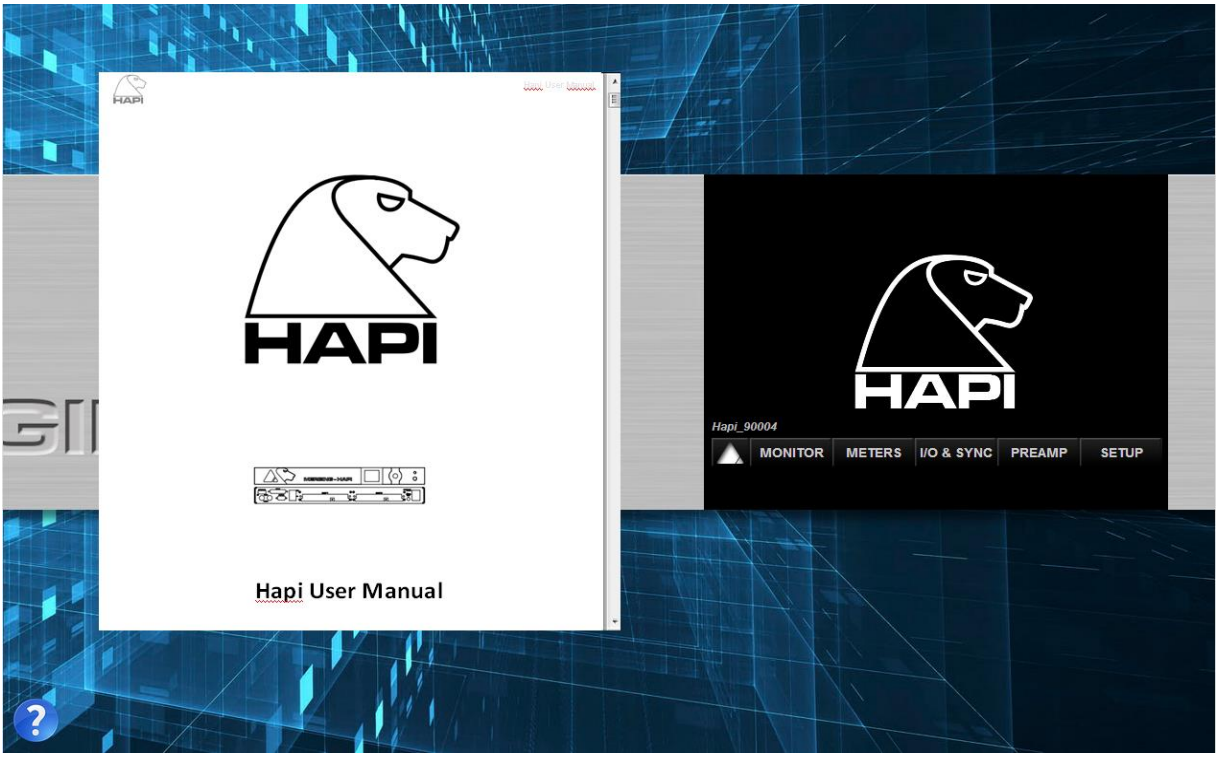
ALL GRP	Will include all faders into the selected group
RMN GRP	Will include the remaining faders into the selected group
RST GRP	Will reset the selected group
RST ALL GRP	Will reset all groups, all grouping will be reset to default

Network web menu
The Network page allows users to personalize a name for the Hapi unit.

The Hapi embedded User Manual

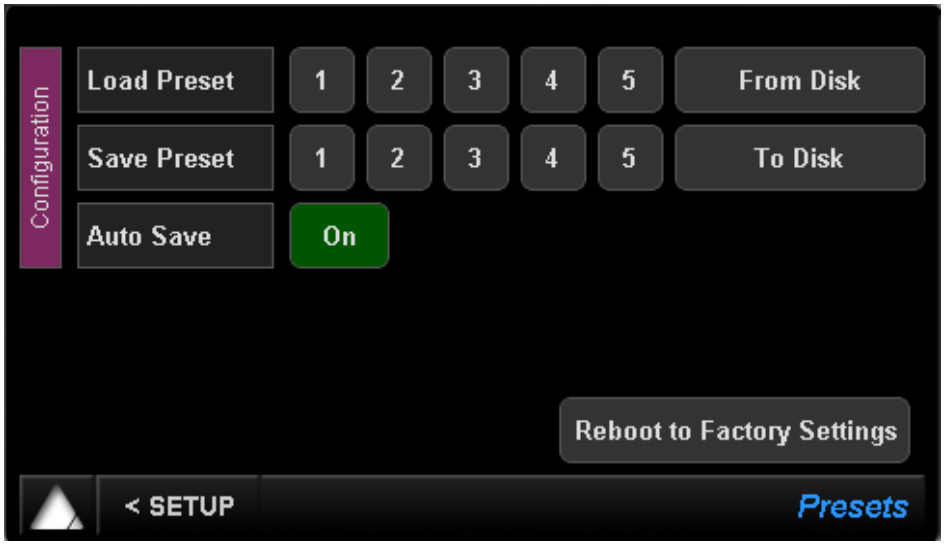
The Hapi embedded User Manual can be opened by clicking on the question mark sign at the bottom left of your browser. This will overlay the Hapi User Manual on your Web control access page.

Figure5 Hapi Embedded User Manual



The Hapi Presets:
Disk Presets can be stored and loaded on your local system where Hapi is connected to.

Hapi Preset menu

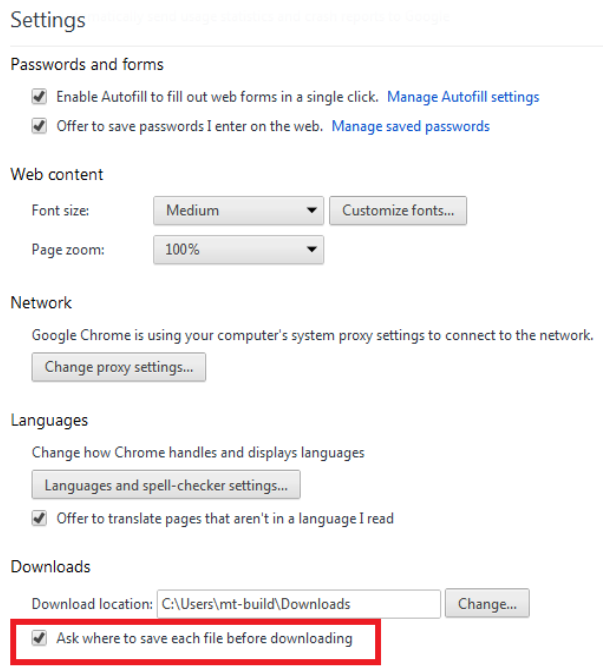


Save Presets	Up to 5 presets can be saved and stored in the Hapi
Load Presets	Up to 5 presets can be loaded from the Hapi
From Disk	Users can load some presets that were stored on your local Hard Drive
To Disk	Users can save some presets to your local Hard Drive
Reboot to Factory	Will reset all the Hapi parameters to the default factory settings

Note: Stored Hapi preset have a .bin file extension. In order to be able to rename the Hapi preset file at save the Chrome browser users will need to adjust this Setting.

1. Go into Chrome Settings
2. Click on Show advanced settings
3. Under Downloads, check the box « Ask where to save each file before downloading »

Now when clicking on « to Disk » a window pops up that allows you to change the name of the preset (.bin) file prior to saving it.


Settings
Passwords and forms
Enable Autofill to fill out web forms in a single click. Manage Autofill settings
Offer to save passwords I enter on the web. Manage saved passwords
Web content
Font size: Medium Customize fonts...
Page zoom: 100%
Network
Google Chrome is using your computer's system proxy settings to connect to the network.
Change proxy settings...
Languages
Change how Chrome handles and displays languages
Languages and spell-checker settings...
Offer to translate pages that aren't in a language I read
Downloads
Download location: C:\Users\mt-build\Downloads Change...
Ask where to save each file before downloading

Note: When saving presets to Disk with the Chrome Brower it is possible that the save windows dialog does not show up. It such case it is due to the browser Pop-Up blocker configuration. Make sure that you allow pop-ups from your Hapi.

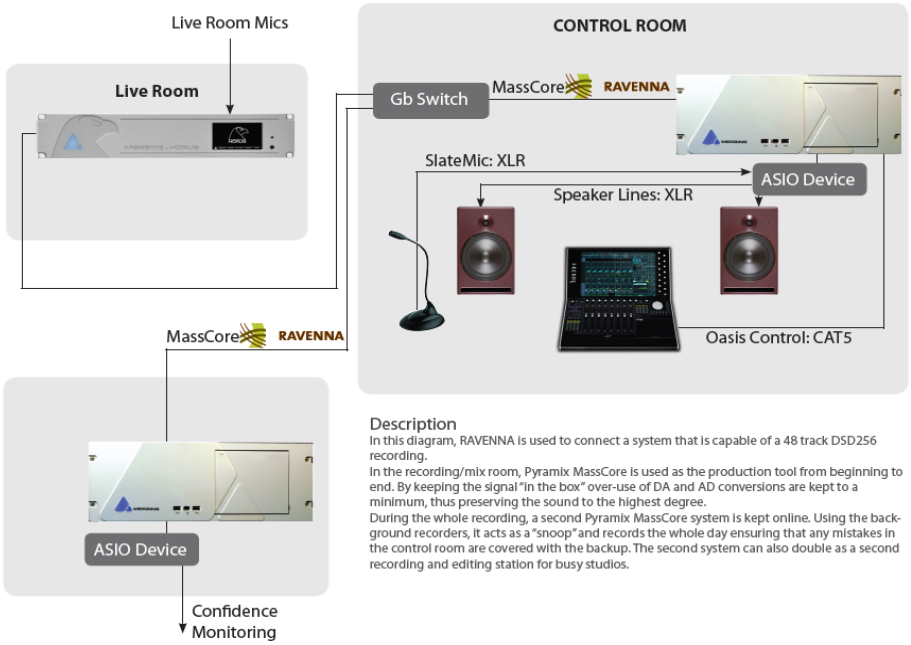
Hapi & Horus setup examples

RAVENNA Network For DSD256 Mix/Record With Backup Recorder

Stage Equipment
1xIOC-HORUS with a total of
- 6xAD8P Premium AD cards (48 Channels)

Mix/Recording Room
- MassCore Pyramix Recording System
- PSI A215M reference monitors
- Tango2 Control surface
- Secondary Audio Device over USB/PCIe
- Talkback Microphone

Backup Recording/Editing Rig
- MassCore Pyramix Recording system
- Secondary ASIO Device (USB)



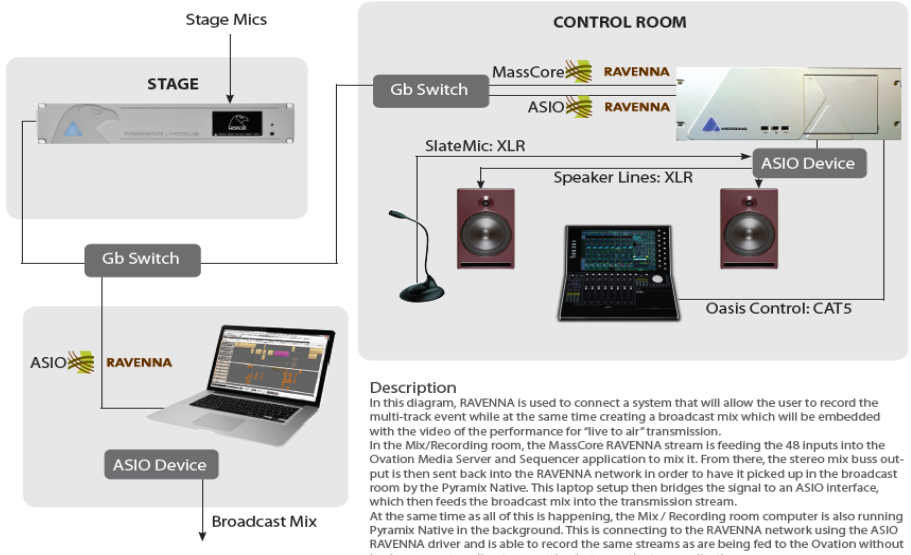
Description
In this diagram, RAVENNA is used to connect a system that is capable of a 48 track DSD256 recording.
In the recording/mix room, Pyramix MassCore is used as the production tool from beginning to end. By keeping the signal "in the box" over-use of DA and AD conversions are kept to a minimum, thus preserving the sound to the highest degree.
During the whole recording, a second Pyramix MassCore system is kept online. Using the background recorders, it acts as a "snoop" and records the whole day ensuring that any mistakes in the control room are covered with the backup. The second system can also double as a second recording and editing station for busy studios.

RAVENNA Network For Mix/Record and Live transmission of multichannel performance

Stage Equipment
1xIOC-HORUS with a total of
- 6xAD8P Premium AD cards (48 Channels)
- 1x DA8 Standard DA card (swap out card for one of the AD cards to provide a 40/8 configuration if needed)

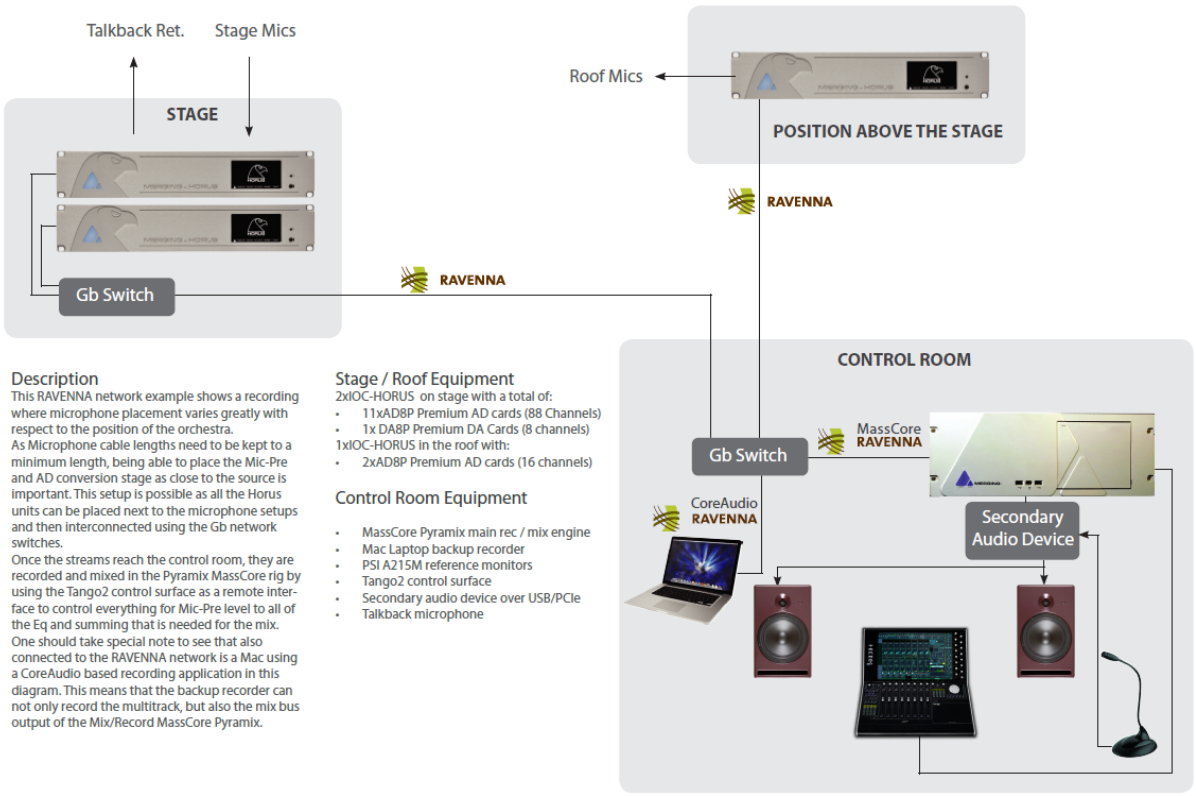
Mix/Recording Room
- MassCore Ovation Mix / Playout Engine
- Pyramix Native Recorder on same computer
- PSI A215M reference monitors
- Tango2 Control surface
- Secondary Audio Device over USB/PCIe
- Talkback Microphone

Broadcast Room
Pyramix Native Music Pack
- MacAir Running Window7 64bit/Bootcamp
- ASIO RAVENNA Driver
- Secondary ASIO Device (USB)



Description
In this diagram, RAVENNA is used to connect a system that will allow the user to record the multi-track event while at the same time creating a broadcast mix which will be embedded with the video of the performance for "live to air" transmission.
In the Mix/Recording room, the MassCore RAVENNA stream is feeding the 48 inputs into the Ovation Media Server and Sequencer application to mix it. From there, the stereo mix buss output is then sent back into the RAVENNA network in order to have it picked up in the broadcast room by the Pyramix Native. This laptop setup then bridges the signal to an ASIO interface, which then feeds the broadcast mix into the transmission stream.
At the same time as all of this is happening, the Mix / Recording room computer is also running Pyramix Native in the background. This is connecting to the RAVENNA network using the ASIO RAVENNA driver and is able to record the same streams as are being fed to the Ovation without having to create a direct connection between the two applications.
The second GB switch that is in the Mix/Recording room is there for a future expansion where a redundant recorder cold be put in place by simply plugging into the switch.

RAVENNA Network for Orchestral Recording with Multiple Microphone Positions



Description

This RAVENNA network example shows a recording where microphone placement varies greatly with respect to the position of the orchestra.
As Microphone cable lengths need to be kept to a minimum length, being able to place the Mic-Pre and AD conversion stage as close to the source is important. This setup is possible as all the Horus units can be placed next to the microphone setups and then interconnected using the Gb network switches.
Once the streams reach the control room, they are recorded and mixed in the Pyramix MassCore rig by using the Tango2 control surface as a remote interface to control everything for Mic-Pre level to all of the Eq and summing that is needed for the mix.
One should take special note to see that also connected to the RAVENNA network is a Mac using a CoreAudio based recording application in this diagram. This means that the backup recorder can not only record the multitrack, but also the mix bus output of the Mix/Record MassCore Pyramix.

Stage / Roof Equipment

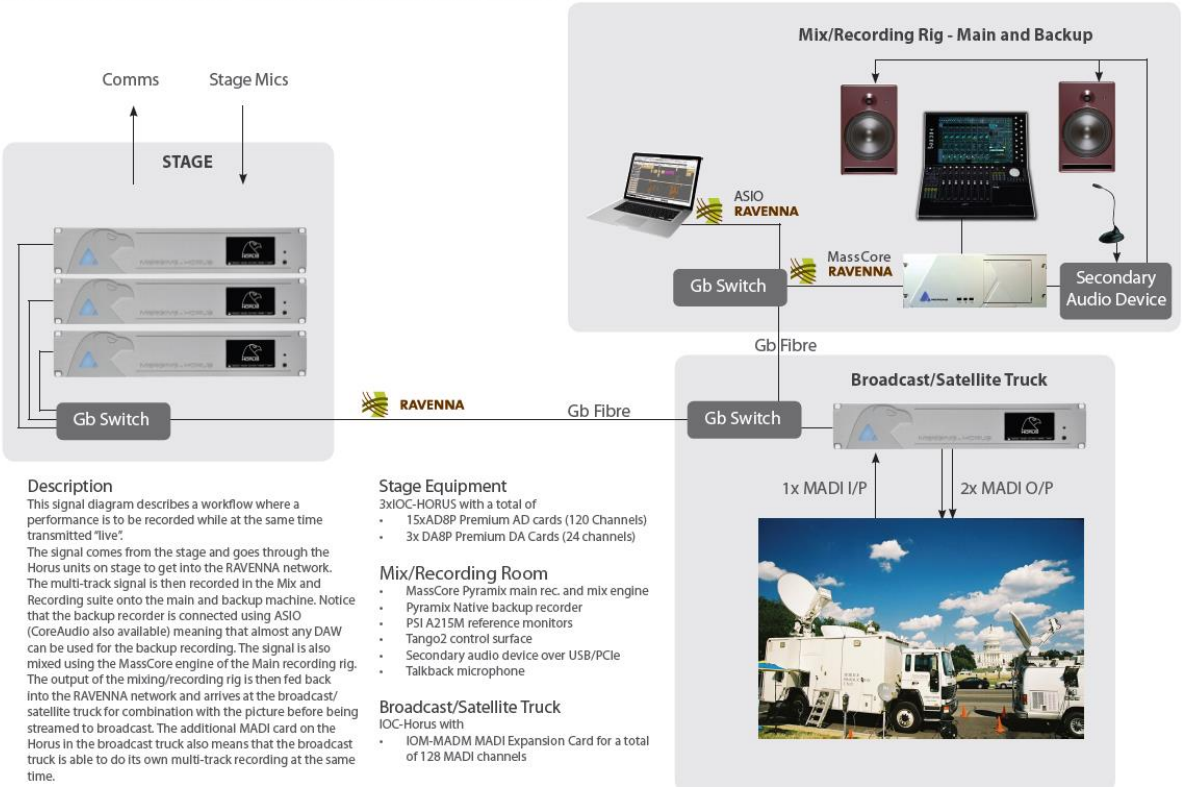
2xIOC-HORUS on stage with a total of:
- 11xAD8P Premium AD cards (88 Channels)
- 1x DA8P Premium DA Cards (8 channels)

1xIOC-HORUS in the roof with:
- 2xAD8P Premium AD cards (16 channels)

Control Room Equipment

- MassCore Pyramix main rec / mix engine
- Mac Laptop backup recorder
- PSI A215M reference monitors
- Tango2 control surface
- Secondary audio device over USB/PCIe
- Talkback microphone

RAVENNA Network for Live Performance Broadcast



Description

This signal diagram describes a workflow where a performance is to be recorded while at the same time transmitted "live".
The signal comes from the stage and goes through the Horus units on stage to get into the RAVENNA network. The multi-track signal is then recorded in the Mix and Recording suite onto the main and backup machine. Notice that the backup recorder is connected using ASIO (CoreAudio also available) meaning that almost any DAW can be used for the backup recording. The signal is also mixed using the MassCore engine of the Main recording rig. The output of the mixing/recording rig is then fed back into the RAVENNA network and arrives at the broadcast/satellite truck for combination with the picture before being streamed to broadcast. The additional MADI card on the Horus in the broadcast truck also means that the broadcast truck is able to do its own multi-track recording at the same time.

Stage Equipment

3xIOC-HORUS with a total of
- 15xAD8P Premium AD cards (120 Channels)
- 3x DA8P Premium DA Cards (24 channels)

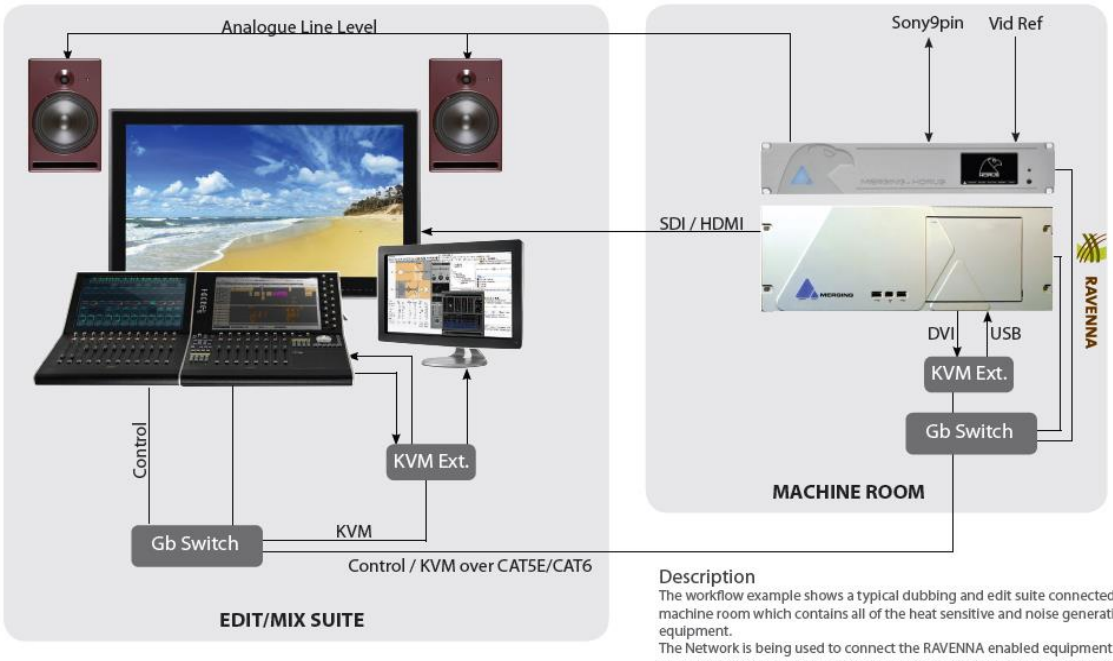
Mix/Recording Room

- MassCore Pyramix main rec. and mix engine
- Pyramix Native backup recorder
- PSI A215M reference monitors
- Tango2 control surface
- Secondary audio device over USB/PCIe
- Talkback microphone

Broadcast/Satellite Truck

IOC-Horus with
- IOM-MADM MADI Expansion Card for a total of 128 MADI channels

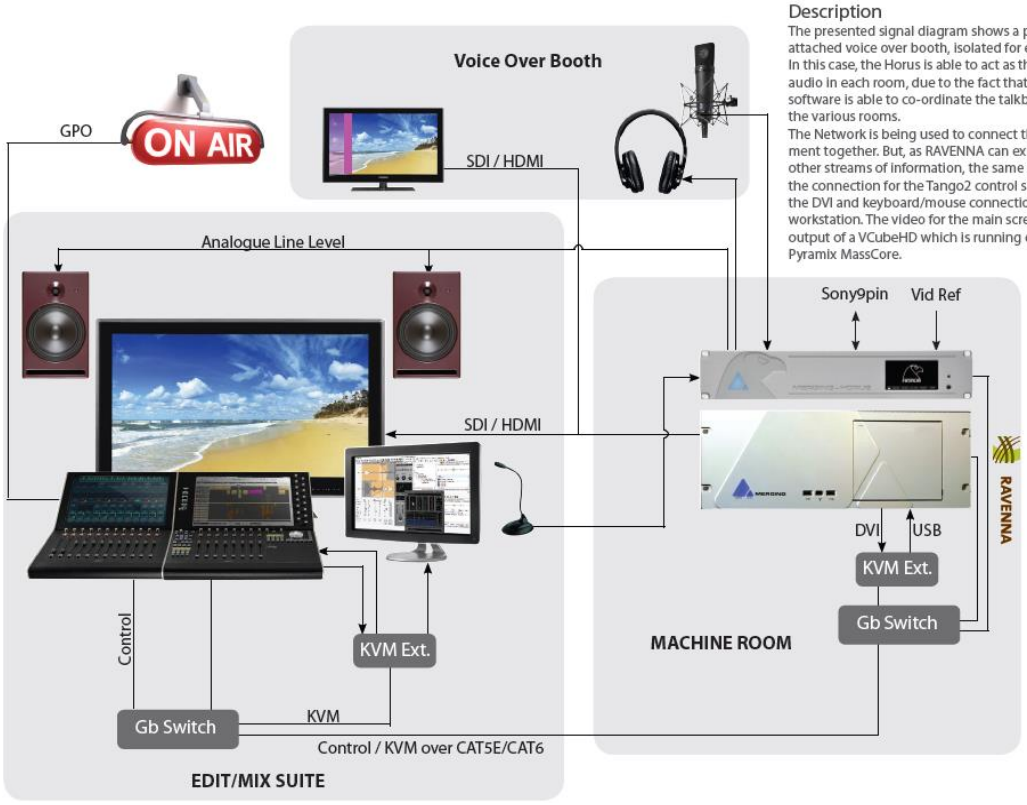
RAVENNA Network For Edit / Mix Suite with Seperate Machine Room



Description

The workflow example shows a typical dubbing and edit suite connected to a local machine room which contains all of the heat sensitive and noise generating equipment.
The Network is being used to connect the RAVENNA enabled equipment together. But, as RAVENNA can exist on the same network as other streams of information, the same network is being used to create the connection for the Tango2 control surface as well as to extended the DVI and keyboard/mouse connections for the Pyramix MassCore workstation. The video for the main screen is being fed from the SDI output of a VCubeHD which is running on the same workstation as the Pyramix MassCore.

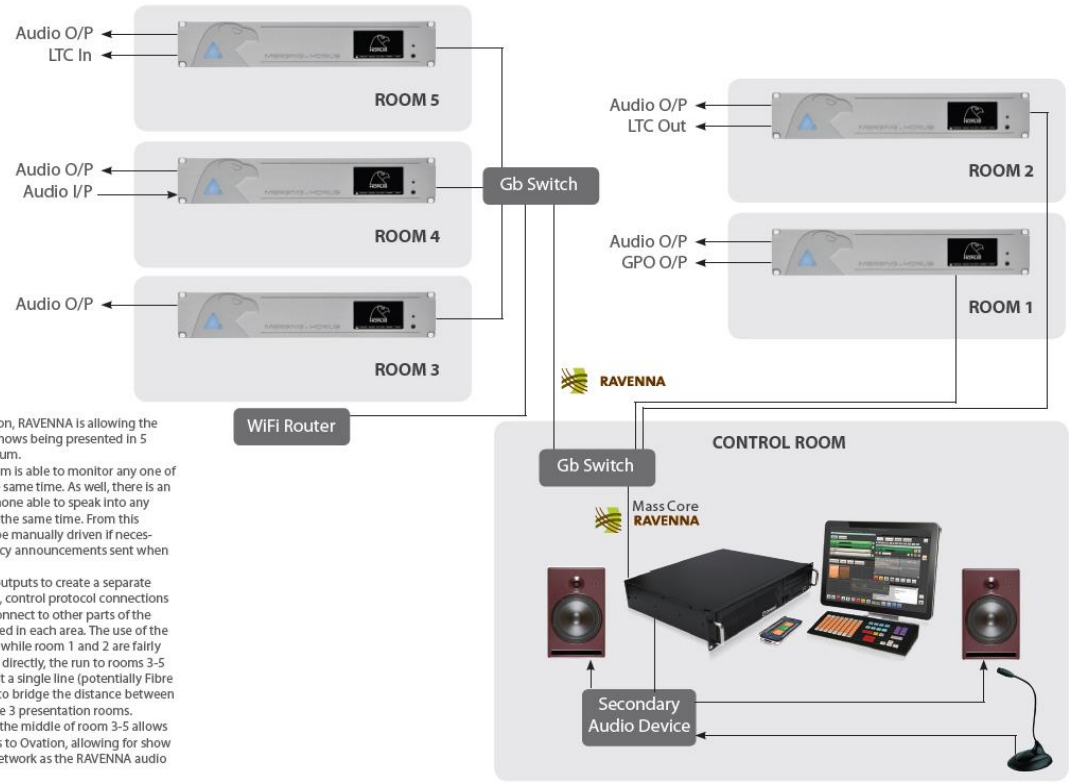
RAVENNA Network For Edit / Mix Suite with Seperate Machine Room and VO Booth



Description

The presented signal diagram shows a post-production suite with an attached voice over booth, isolated for ease of recording.
In this case, the Horus is able to act as the central source for all of the audio in each room, due to the fact that the Pyramix MassCore software is able to co-ordinate the talkback and monitoring streams to the various rooms.
The Network is being used to connect the RAVENNA enabled equipment together. But, as RAVENNA can exist on the same network as other streams of information, the same network is being used to create the connection for the Tango2 control surface as well as to extended the DVI and keyboard/mouse connections for the Pyramix MassCore workstation. The video for the main screen is being fed from the SDI output of a VCubeHD which is running on the same workstation as the Pyramix MassCore.

RAVENNA Network for Multiroom Museum Installation



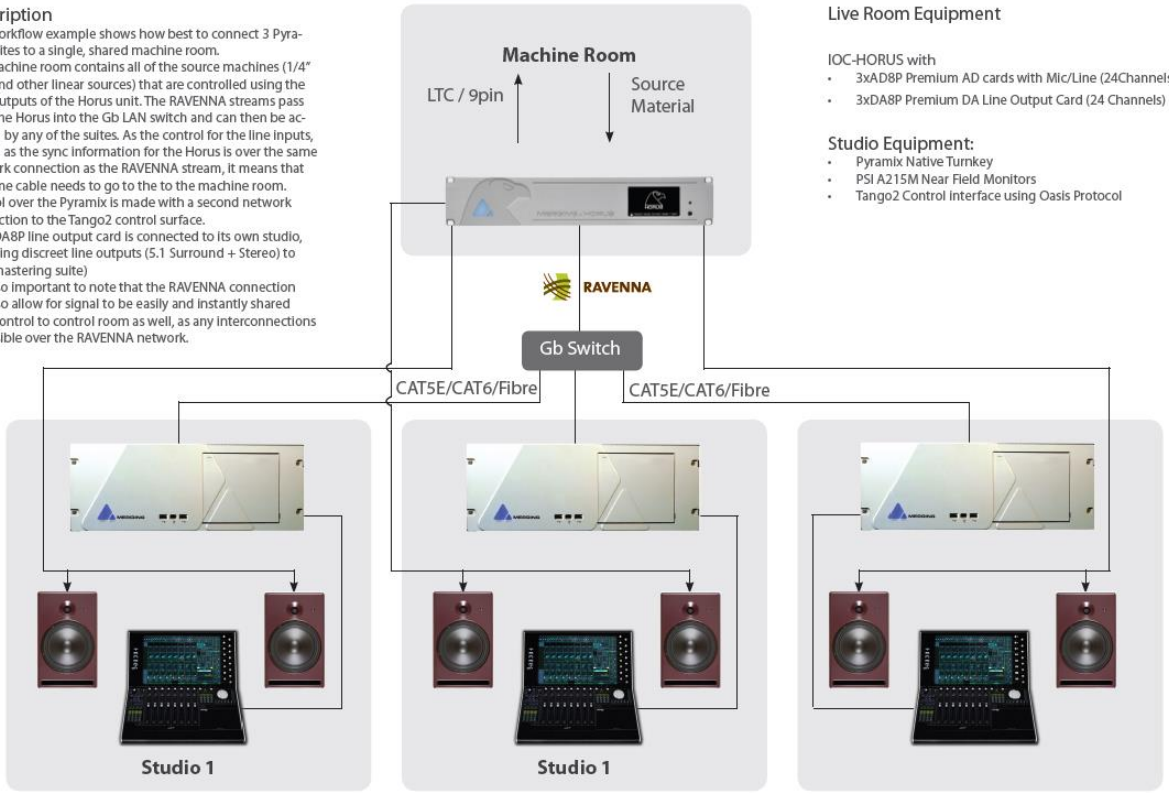
Description

In this Ovation installation, RAVENNA is allowing the Ovation to control the shows being presented in 5 separate rooms of Museum.
The Ovation Control room is able to monitor any one of the rooms, or all 5 at the same time. As well, there is an announcement microphone able to speak into any amount of the rooms at the same time. From this position, the show can be manually driven if necessary, as well as emergency announcements sent when needed.
Each Room uses audio outputs to create a separate sonic environment. Also, control protocol connections are used to be able to connect to other parts of the AV system that are located in each area. The use of the switches is to show that while room 1 and 2 are fairly close and can be cabled directly, the run to rooms 3-5 are far enough away that a single line (potentially Fibre could be used) in order to bridge the distance between the control room and the 3 presentation rooms.
Lastly, the Wifi router in the middle of room 3-5 allows for the webserver access to Ovation, allowing for show control over the same network as the RAVENNA audio streams.

RAVENNA Network for Multiple Mastering Suites with a Shared Machine Room

Description

This workflow example shows how best to connect 3 Pyramix suites to a single, shared machine room.
The Machine room contains all of the source machines (1/4" tape and other linear sources) that are controlled using the sync outputs of the Horus unit. The RAVENNA streams pass from the Horus into the Gb LAN switch and can then be accessed by any of the suites. As the control for the line inputs, as well as the sync information for the Horus is over the same network connection as the RAVENNA stream, it means that only one cable needs to go to the to the machine room.
Control over the Pyramix is made with a second network connection to the Tango2 control surface.
Each DA8P line output card is connected to its own studio, providing discreet line outputs (5.1 Surround + Stereo) to each mastering suite)
It is also important to note that the RAVENNA connection will also allow for signal to be easily and instantly shared from control to control room as well, as any interconnections is possible over the RAVENNA network.



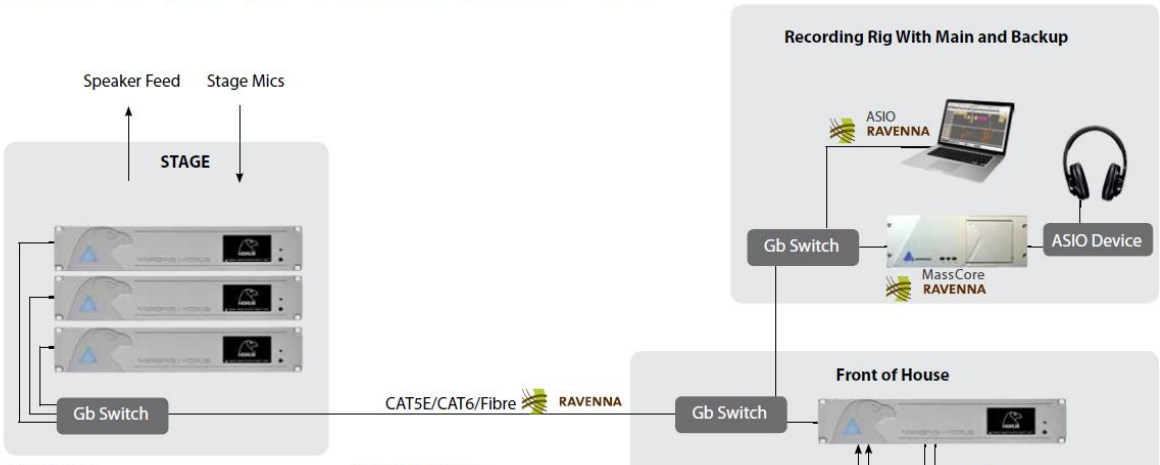
Live Room Equipment

IOC-HORUS with
- 3xAD8P Premium AD cards with Mic/Line (24Channels)
- 3xDA8P Premium DA Line Output Card (24 Channels)

Studio Equipment:

- Pyramix Native Turnkey
- PSI A215M Near Field Monitors
- Tango2 Control interface using Oasis Protocol

RAVENNA Network for Concert Event with standard FOH console



Description

This signal diagram outlines a workflow where Horus and RAVENNA AoIP are used to create an I/O system for a large live concert event.
The signal comes from the stage and goes through the Horus units on stage to get into the RAVENNA network. The multi-track signal is then recorded in the recording suite onto the main and backup machine. Notice that the backup recorder is connected using ASIO (CoreAudio also available) meaning that almost any DAW can be used for the backup recording.
The signal is also being sent in parallel to the FOH position and connected to the console using MADI Inputs. The Buss outputs of the desk then feed back into the RAVENNA stream and the signal is sent back to the Horus units on stage to provide speaker feeds and monitor mixes. The Mix output is also being sent simultaneously to the record devices so as to capture the mix as well as the discreet multi-track.

Stage Equipment

3xIOC-HORUS with a total of
- 15xAD8P Premium AD cards (120 Channels)
- 3x DA8P Premium DA Cards (24 channels)

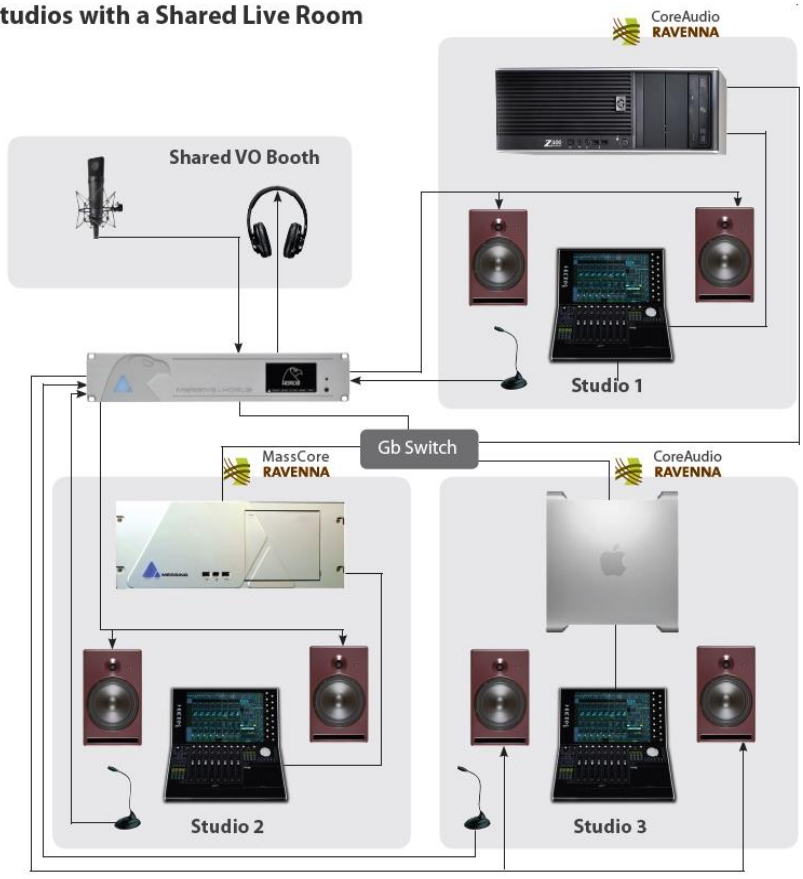
Recording Rig

MassCore Pyramix main recorder
- Pyramix Native backup recorder
- PSI A215M reference monitors
- Tango2 control surface
- Secondary audio device over USB/PCIe
- Talkback microphone

FOH position

IOC-Horus with
- IOM-MADM MADI Expansion Card for a total of 128 MADI channels

RAVENNA Network for Multiple Studios with a Shared Live Room



Shared Equipment

IOC-HORUS with
- 1xAD8P Premium AD cards with Mic/Line (8 Channels)
- 3xDA8P Premium DA Line Output Card (8 Channels/room)

Studio Equipment:

- Studio 1: PC Based DAW (Sequoia, SADIE etc)
- Studio 2: MassCore Pyramix
- Studio 3: Mac-based DAW (Nuendo/Protools etc)
- PSI A215M Near Field Monitors
- Tango2 Control interface using Oasis Protocol
- Talkback Microphone

Description

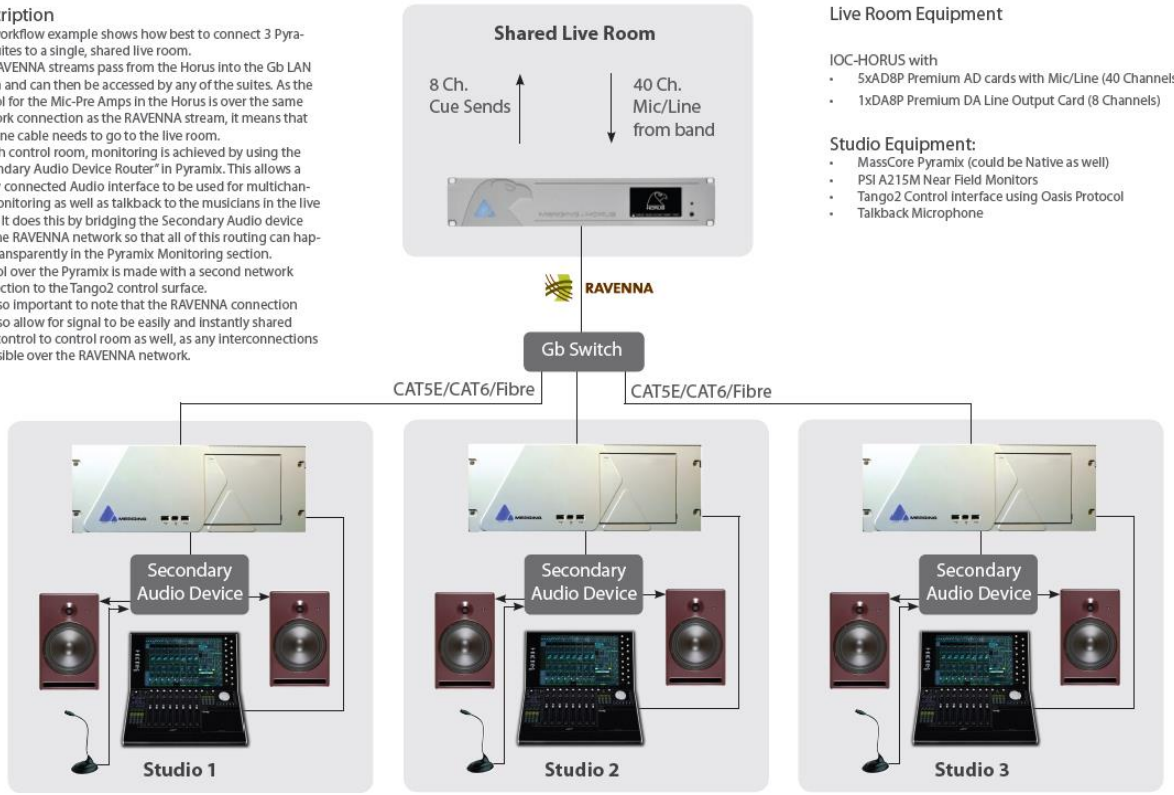
In this signal diagram of a RAVENNA network we are showing an incredibly useful feature of the Horus interface. Each 8 channels of Input or Output can be shared between a Number of DAW's, OR dedicated to a specific one, allowing for professional quality I/O to exist in each dubbing suite, even though it is all being managed by a central piece of equipment.

The diagram also shows that, by use of an ASIO or CoreAudio RAVENNA driver, 3rd party DAW solutions on either Mac or PC can connect to the RAVENNA network. This means that they can use and share the Horus I/O as well as share signal in between each workstation, provided of course all workstations operate at the same common sampling rate

RAVENNA Network for Multiple Studios with a Shared Live Room

Description

This workflow example shows how best to connect 3 Pyramix suites to a single, shared live room.
The RAVENNA streams pass from the Horus into the Gb LAN switch and can then be accessed by any of the suites. As the control for the Mic-Pre Amps in the Horus is over the same Network connection as the RAVENNA stream, it means that only one cable needs to go to the live room.
In each control room, monitoring is achieved by using the "Secondary Audio Device Router" in Pyramix. This allows a locally connected Audio interface to be used for multichannel monitoring as well as talkback to the musicians in the live room. It does this by bridging the Secondary Audio device into the RAVENNA network so that all of this routing can happen transparently in the Pyramix Monitoring section.
Control over the Pyramix is made with a second network connection to the Tango2 control surface.
It is also important to note that the RAVENNA connection will also allow for signal to be easily and instantly shared from control to control room as well, as any interconnections is possible over the RAVENNA network.



Live Room Equipment

IOC-HORUS with
- 5xAD8P Premium AD cards with Mic/Line (40 Channels)
- 1xDA8P Premium DA Line Output Card (8 Channels)

Studio Equipment:

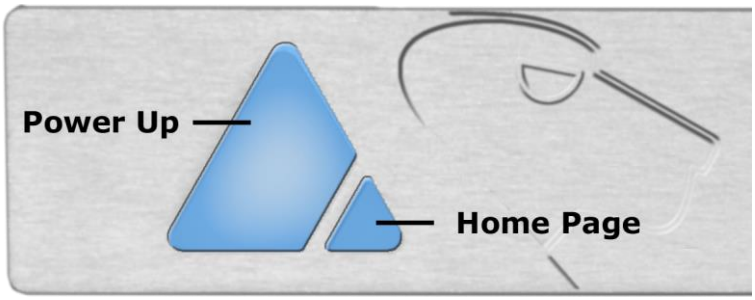
- MassCore Pyramix (could be Native as well)
- PSI A215M Near Field Monitors
- Tango2 Control interface using Oasis Protocol
- Talkback Microphone

Hapi Firmware update procedure

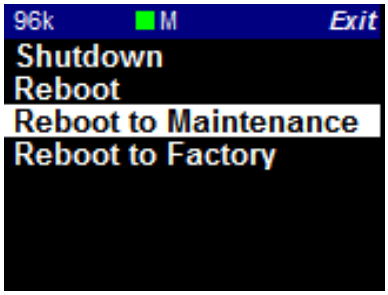
1) Download the latest firmware available. Can be found at http://www.merging.com/products/horus/downloads

2) Make sure that the .bin downloaded firmware file is on a PC that is on the same network as your Hapi. (Users who have received a .rar will first have to Unrar it)

3) Power up the Hapi using the big power button, while pressing down and holding the Home Page button (small pyramid) a few seconds in order to start up in Maintenance Mode

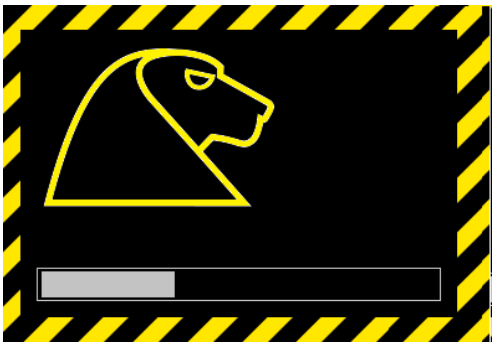


You can also reboot the Hapi to Maintenance mode from the OLED Screen Exit menu



Or from the Hapi Web Access set up page.

4) Keep the small button pressed until the yellow caution border display appears on the TFT screen



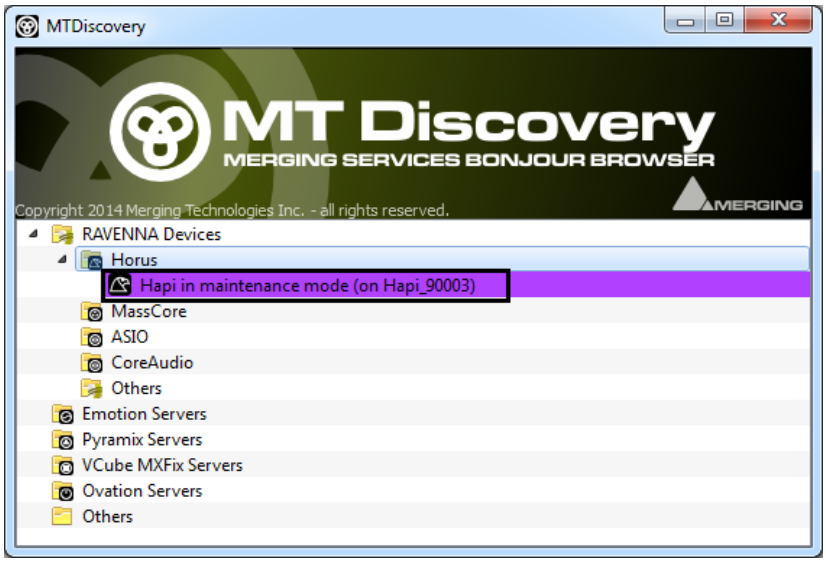
5) Wait until the Hapi is fully booted (the progress bar says “Ready”)

Note: If you wish to cancel the Hapi Maintenance mode you can do so from the Web access page or by pressing the small physical power button, this will reboot the Hapi in normal mode.

You can also press the small triangle button in order to reboot the Hapi. Be aware that the small triangle button is only active for reboot when in Maintenance mode.

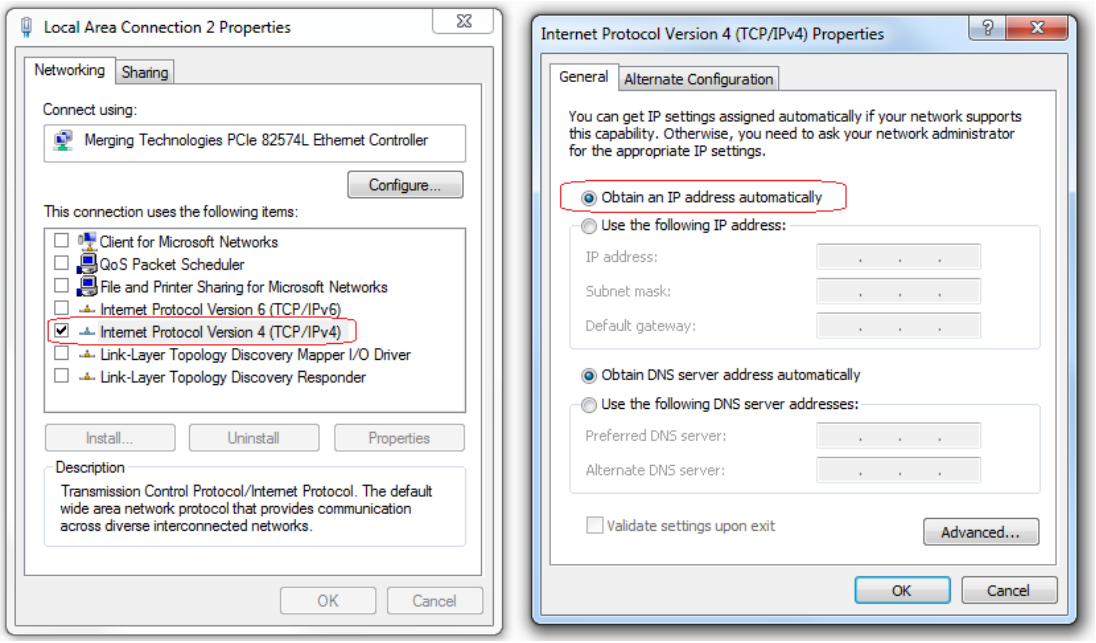
Warning: We do not recommend that you refresh the browser page or restart the Hapi while a firmware update is in progress and we recommend only gigabit Ethernet port or switch connection. Refer to the Merging RAVENNA Network Guide for example
http://www.merging.com/products/horus/downloads

6) Open the MTDiscovery tool, you should see a device called “Hapi in Maintenance Mode”, double-click on it.
MT Discovery is installed with Pyramix v9 or v10. But for Hapi standalone users it can also be downloaded from



Note: If you do not see the Hapi Maintenance Mode entry, reboot Hapi in Maintenance mode and verify your Hapi Ethernet Connection to the MassCore Gb Ethernet Card.
If you still do not see the Hapi maintenance mode under MT Discovery. Open your Windows Device Manager and look in the Network Adapter section. Disable and re-enable the Merging Technologies PCIe Ethernet controller.

Warning: Hapi Maintenance mode uses Auto IP config. Therefore en sure that you the PC is configured to obtain an IP address automatically when performing a firmware update.


Local Area Connection 2 Properties
Networking
Sharing
Connect using:
Merging Technologies PCIe 82574L Ethernet Controller
Configure...
This connection uses the following items:
Client for Microsoft Networks
QoS Packet Scheduler
File and Printer Sharing for Microsoft Networks
Internet Protocol Version 6 (TCP/IPv6)
Internet Protocol Version 4 (TCP/IPv4)
Link-Layer Topology Discovery Mapper I/O Driver
Link-Layer Topology Discovery Responder
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK
Cancel
Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

7) Your default web browser (Merging recommends **Google Chrome** for best results) should open up on a firmware update page

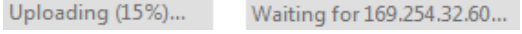
HAPI
Please select the firmware image file to update your Hapi device with:
- No File Selected -
Select File
Upload
Cancel & Reboot

Note: If your web browser does not open on the firmware upgrade page, clear your browser history and re-open the Hapi page by Double Clicking on the "Hapi in Maintenance Mode" entry in MT Discovery.
Note: Do not perform a Firmware upgrade if you plan to install Pyramix v8 simultaneously. Proceed only with one at a time.

8) Click on "Select File" and choose the file (.hapi) that you have previously unzipped on your disk

9) Click on "Update Device" (after a while, you will see some messages on the TFT screen).

Warning: During update do not update your browser (refresh), until the process is completed.
The Firmware update should take from 3 to 5 minutes.
You can see progress indicated at the bottom of your Browser Page and on the Hapi screen

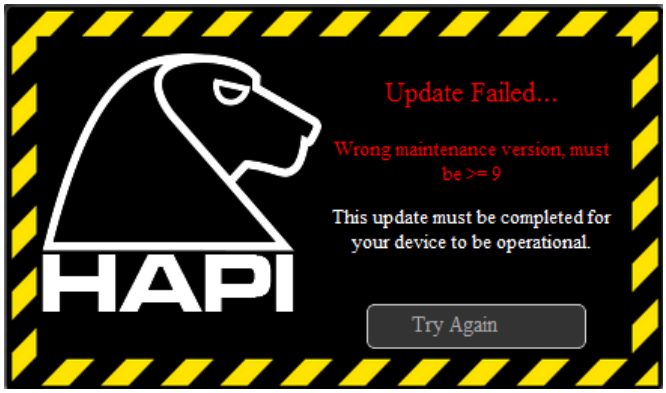


10) Wait until the webpage says “Update successful!” and Hapi screen displays “Please Shutdown”.

Web Access page

Hapi on screen

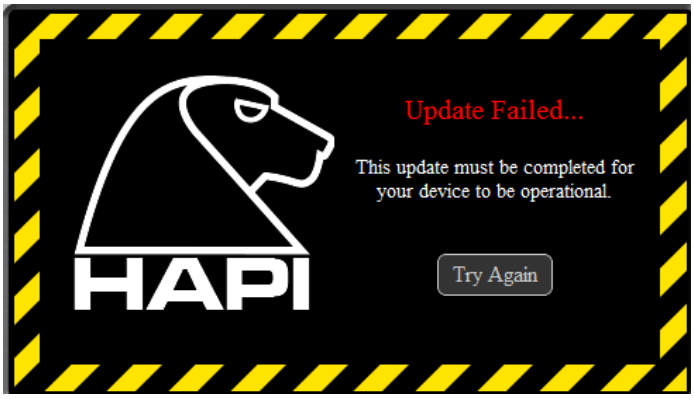
Warning: Some Firmware updates will require first a Hapi Maintenance Mode update. In such case you might see a message posted like “Wrong maintenance version, must be >= 31” .
Note: A Maintenance Mode update requires a shutdown of the Hapi once the update completed.


Update Failed...
Wrong maintenance version, must be >= 9
This update must be completed for your device to be operational.
Try Again

11) Shutdown your Hapi after the Firmware or Maintenance Mode update. Restart your Hapi manually afterwards.

12) You can verify the firmware version installed by going into the Hapi Setup menu and selecting System info. The firmware version and date of issue will be displayed.

IMPORTANT: If the Firmware update procedure fails, repeat the Firmware update procedure by pressing the “Try Again’ Button (it will bring you back to step 7)



Avoid powering down the Hapi if the firmware update has failed. It is mandatory that you attempt to re-update the firmware, refresh the online web page if necessary. Or go back to the

previous browser page and select the firmware again and re-update it. If you do not proceed in this way the Hapi may no longer start up. Then a return to factory might be required.

If a fail message is posted saying “Wrong maintenance version, must be >= 31”. This means that you must first install the latest Maintenance Firmware prior to updating to the latest Firmware

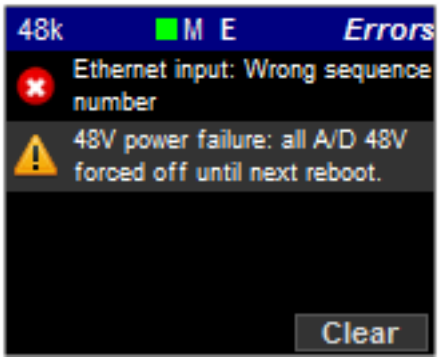
Contact us at support@merging.com if your firmware update cannot be executed

Hapi troubleshooting

Hapi on screen Error Report

Your Hapi can display on the OLED screen some detected errors. In case of an error report the Hapi will display the message on its screen. Refer to the error list below as a reference. Once the issue is sorted Press the “clear” button to remove reported error. If the message reappears it indicates that the error is still present.

Hapi Error report example:



Potential reported errors:

"Primary Power Supply Failure";
"Secondary Power Supply Failure";
One of your Power supply is down, it is recommended that you eventually shutdown the Hapi and verify your power cord connections

"Hapi Application failure, please reboot"
The Hapi internal application has failed. Will require a reboot, make sure that you are using the latest Hapi firmware available. If the problem persists contact support@merging.com

"Ethernet input: GP fifo overrun";
"Ethernet input: GP descriptors fifo overrun";
The Ethernet communication is overloaded. The bandwidth is too small. Verify your set up, take note that a RAVENNA Network configuration must be running on a dedicated and certified Merging Switch. If problem persists contact our support team.

"Ethernet input: Audio packet still pending";
"Ethernet input: Audio pipeline too small";
"Ethernet input: Wrong sequence number";
"Ethernet input: CRC error";
"Ethernet input: Queue mux error";
"Ethernet input: Audio buffer too small";
"Ethernet input: SSRC mismatch"
Error on the incoming RAVENNA streams. There might be click on the physical output of the Hapi. Such a click could have occurred on one of the RAVENNA bank of 8 channels. Verify your set up, mainly on the network side and afterwards clear the error. If the problem persists contact our support team.

"Ethernet input: Unknown error";
"FPGA memory: Timeout";
"FPGA memory: Unknown error";
Contact Merging Support

“48V power failure: all A/D 48V forced off until next reboot”
The attached error message is displayed when:

1. 48V is malfunctioning
2. If there is a short circuit on 48V

If a MAJOR (by MAJOR, we mean that the threshold of short-circuit detection requires at least 10 Preamp inputs to be shorted simultaneously) 48V Phantom Power Supply short circuit is detected, 48V is forced off on all A/D channels and the following error message is displayed.
Note: 48V will be forced off until reboot.
Note: the user 48V settings are not affected i.e. the UI still shows the 48V as configured by the user.

How to provide Merging Support with a Hapi debug dump file

Dump procedure:

1. Connect the Hapi to your system via Ethernet

2. Open a web browser (e.g. Google Chrome) and make sure that you type in your Hapi Ip address

3. This should open the Main Hapi Page (alternatively open the Hapi Web page from the MT Discovery tool)

4. Follow the Hapi Name entry <Hapi name>.local/. with the /debug/syslog
   Example: *Hapi_80028.Local./debug/syslog*
   Right-click and export the Hapi syslog.txt file

5. Perform the same but this time export the config file as example below.
   Example: *Hapi_80028.Local./debug/config*
   Right-click and export the Hapi config.txt file

6. Send both file to support@merging.com

Cannot access Hapi remotely in Maintenance mode for Firmware update

Procedure:

1. First launch MTDiscovery and open the Hapi Maintenance Mode entry
2. If such entry does not show up, reboot your system and retry
3. If it still does not work, make sure that your Network card is set to Automatic IP addressing (see page 58 above)
4. If case none of the above works, make sure that the Hapi if well connected to your system via Ethernet. It is mandatory that the Ethernet port or Switch is a Gigabit one.
5. Make sure that the Ethernet cable is Cat 5E or 6
6. On the Hapi Maintenance TFT screen take note of the written IP Address
7. Type this address in your Chrome browser followed by :8080
   Example: 169.254.182.31**:8080**

   You should now have access to the Hapi remote Maintenance page and be able to update your Hapi firmware.

Firewall and Antivirus

Windows Firewall:
The Windows Firewall can block communication between MassCore and Hapi. We recommend users to disable the Public Network Firewall
Procedure:
1. Go into Windows Control Panel > Windows Firewall.
2. Click on “Turn Windows Firewall on or off”
3. Go to the Public Network section and select “Turn Off Windows Firewall”

Disable Antivirus:
Merging also recommends users to disable their Antivirus, some Antivirus as Avast or Sophos have been known to block the Hapi discovery and RAVENNA I/O Connections